

Comparison 45 mA pulsed / 10 mA CW lattices
with errors

80 parameters scanned

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ALIGN Parameter TRACKv39

- **ALIGN** name δ_{xy} δ_z ϕ_z $\delta\phi_{dyn.}$ $\delta F_{dyn.}$ $\delta\phi_{static}$ δF_{static}
 - ▶ From RFQ exit to end of the CW 2 GeV linac (~ 400 meters)
 - ▶ 80 errors simulated with TRACKv39
 - ▶ Each error simulated with 100 runs with 3D SC (10 mA)
 - ▶ $80 \times 100 = 8000$ runs with TRACKv39 on FermiGrid

Parameters 01-20

- ▶ 01/ Solenoids $\delta_{xy} = 150 \mu\text{m}$
- ▶ 02/ Solenoids $\delta_{xy} = 300 \mu\text{m}$
- ▶ 03/ Solenoids $\delta_{xy} = 500 \mu\text{m}$
- ▶ 04/ Solenoids $\delta_{xy} = 750 \mu\text{m}$
- ▶ 05/ Solenoids $\delta_{xy} = 1000 \mu\text{m}$

- ▶ 06/ Solenoids $\delta_z = 150 \mu\text{m}$
- ▶ 07/ Solenoids $\delta_z = 300 \mu\text{m}$
- ▶ 08/ Solenoids $\delta_z = 500 \mu\text{m}$
- ▶ 09/ Solenoids $\delta_z = 750 \mu\text{m}$
- ▶ 10/ Solenoids $\delta_z = 1000 \mu\text{m}$

- ▶ 11/ Sol. Field $\delta F_{dynamic} = 0.5 \%$
- ▶ 12/ Sol. Field $\delta F_{dynamic} = 1.0 \%$
- ▶ 13/ Sol. Field $\delta F_{dynamic} = 1.5 \%$
- ▶ 14/ Sol. Field $\delta F_{dynamic} = 2.0 \%$
- ▶ 15/ Sol. Field $\delta F_{dynamic} = 2.5 \%$

- ▶ 16/ Sol. Field $\delta F_{static} = 0.5 \%$
- ▶ 17/ Sol. Field $\delta F_{static} = 1.0 \%$
- ▶ 18/ Sol. Field $\delta F_{static} = 1.5 \%$
- ▶ 19/ Sol. Field $\delta F_{static} = 2.0 \%$
- ▶ 20/ Sol. Field $\delta F_{static} = 2.5 \%$

Parameters 21-40

- ▶ 21/ Quads $\delta_{xy} = 150 \mu\text{m}$
- ▶ 22/ Quads $\delta_{xy} = 300 \mu\text{m}$
- ▶ 23/ Quads $\delta_{xy} = 500 \mu\text{m}$
- ▶ 24/ Quads $\delta_{xy} = 750 \mu\text{m}$
- ▶ 25/ Quads $\delta_{xy} = 1000 \mu\text{m}$

- ▶ 26/ Quads $\delta_z = 150 \mu\text{m}$
- ▶ 27/ Quads $\delta_z = 300 \mu\text{m}$
- ▶ 28/ Quads $\delta_z = 500 \mu\text{m}$
- ▶ 29/ Quads $\delta_z = 750 \mu\text{m}$
- ▶ 30/ Quads $\delta_z = 1000 \mu\text{m}$

- ▶ 31/ Quads $\phi_z = 1 \text{ mrad}$
- ▶ 32/ Quads $\phi_z = 2 \text{ mrad}$
- ▶ 33/ Quads $\phi_z = 5 \text{ mrad}$
- ▶ 34/ Quads $\phi_z = 7 \text{ mrad}$
- ▶ 35/ Quads $\phi_z = 10 \text{ mrad}$

- ▶ 36/ Quads Field $\delta F_{dynamic} = 0.5 \%$
- ▶ 37/ Quads Field $\delta F_{dynamic} = 1.0 \%$
- ▶ 38/ Quads Field $\delta F_{dynamic} = 1.5 \%$
- ▶ 39/ Quads Field $\delta F_{dynamic} = 2.0 \%$
- ▶ 40/ Quads Field $\delta F_{dynamic} = 2.5 \%$

Parameters 41-60

- ▶ 41/ Quads Field $\delta F_{static} = 0.5 \%$
- ▶ 42/ Quads Field $\delta F_{static} = 1.0 \%$
- ▶ 43/ Quads Field $\delta F_{static} = 1.5 \%$
- ▶ 44/ Quads Field $\delta F_{static} = 2.0 \%$
- ▶ 45/ Quads Field $\delta F_{static} = 2.5 \%$
- ▶ 46/ Cav. $\delta_{xy} = 150 \mu\text{m}$
- ▶ 47/ Cav. $\delta_{xy} = 300 \mu\text{m}$
- ▶ 48/ Cav. $\delta_{xy} = 500 \mu\text{m}$
- ▶ 49/ Cav. $\delta_{xy} = 750 \mu\text{m}$
- ▶ 50/ Cav. $\delta_{xy} = 1000 \mu\text{m}$
- ▶ 51/ Cav. $\delta_z = 150 \mu\text{m}$
- ▶ 52/ Cav. $\delta_z = 300 \mu\text{m}$
- ▶ 53/ Cav. $\delta_z = 500 \mu\text{m}$
- ▶ 54/ Cav. $\delta_z = 750 \mu\text{m}$
- ▶ 55/ Cav. $\delta_z = 1000 \mu\text{m}$
- ▶ 56/ Cav. $\phi_z = 1 \text{ mrad}$
- ▶ 57/ Cav. $\phi_z = 2 \text{ mrad}$
- ▶ 58/ Cav. $\phi_z = 5 \text{ mrad}$
- ▶ 59/ Cav. $\phi_z = 7 \text{ mrad}$
- ▶ 60/ Cav. $\phi_z = 10 \text{ mrad}$

Parameters 61-80

- ▶ 61/ Cav. Phase $\delta\phi_{dynamic} = 0.5^\circ$
- ▶ 62/ Cav. Phase $\delta\phi_{dynamic} = 1.0^\circ$
- ▶ 63/ Cav. Phase $\delta\phi_{dynamic} = 1.5^\circ$
- ▶ 64/ Cav. Phase $\delta\phi_{dynamic} = 2.0^\circ$
- ▶ 65/ Cav. Phase $\delta\phi_{dynamic} = 2.5^\circ$

- ▶ 66/ Cav. Field $\delta F_{dynamic} = 0.5 \%$
- ▶ 67/ Cav. Field $\delta F_{dynamic} = 1.0 \%$
- ▶ 68/ Cav. Field $\delta F_{dynamic} = 1.5 \%$
- ▶ 69/ Cav. Field $\delta F_{dynamic} = 2.0 \%$
- ▶ 70/ Cav. Field $\delta F_{dynamic} = 2.5 \%$

- ▶ 71/ Cav. Phase $\delta\phi_{static} = 0.5^\circ$
- ▶ 72/ Cav. Phase $\delta\phi_{static} = 1.0^\circ$
- ▶ 73/ Cav. Phase $\delta\phi_{static} = 1.5^\circ$
- ▶ 74/ Cav. Phase $\delta\phi_{static} = 2.0^\circ$
- ▶ 75/ Cav. Phase $\delta\phi_{static} = 2.5^\circ$

- ▶ 76/ Cav. Field $\delta F_{static} = 0.5 \%$
- ▶ 77/ Cav. Field $\delta F_{static} = 1.0 \%$
- ▶ 78/ Cav. Field $\delta F_{static} = 1.5 \%$
- ▶ 79/ Cav. Field $\delta F_{static} = 2.0 \%$
- ▶ 80/ Cav. Field $\delta F_{static} = 2.5 \%$

Parameters 141-150

- ▶ 81/ Cav. Phase + Cav. Field $\delta\phi_{dyn.} = 1^\circ$ $\delta F_{dyn.} = 1\%$
- ▶ 82/ 81+ Sol. Field $\delta F_{dyn.} = 0.5 \%$ $\delta F_{static} = 0.05 \%$
- ▶ 83/ 82 + Quads Fields $\delta F_{dyn.} = 0.5 \%$ $\delta F_{static} = 0.05 \%$
- ▶ 84/ 83 + Cav. $\delta_{xy} = 500 \mu\text{m}$
- ▶ 85/ 84 + Cav. $\phi_z = 2 \text{ mrad}$

- ▶ 86/ 85 + Sol. $\delta_{xy} = 150 \mu\text{m}$
- ▶ 87/ 86 + Sol. $\delta_{xy} = 300 \mu\text{m}$
- ▶ 88/ 87 + Sol. $\delta_{xy} = 500 \mu\text{m}$
- ▶ 89/ 88 + Sol. $\delta_{xy} = 750 \mu\text{m}$
- ▶ 90/ 89 + Sol. $\delta_{xy} = 1000 \mu\text{m}$

(01) Solenoids $\delta_{xy} = 150 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

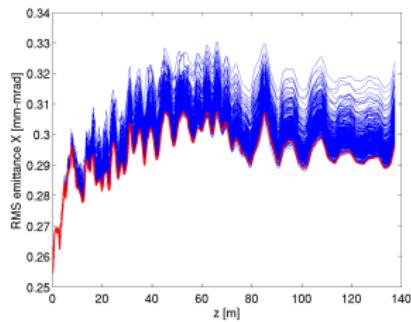


Figure: RMS Emittance Y / Pulsed

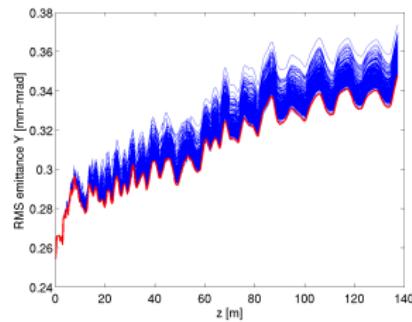


Figure: RMS Emittance X / CW

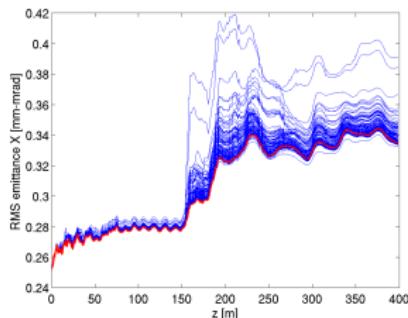
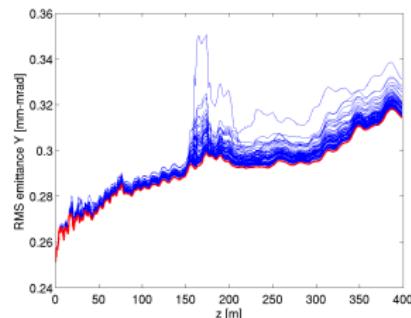


Figure: RMS Emittance Y / CW



(02) Solenoids $\delta_{xy} = 300 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

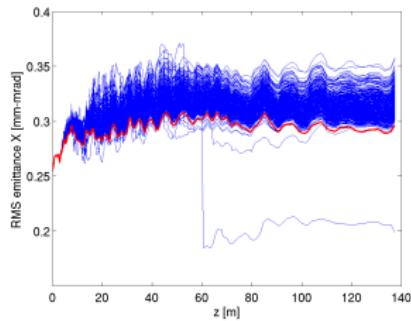


Figure: RMS Emittance Y / Pulsed

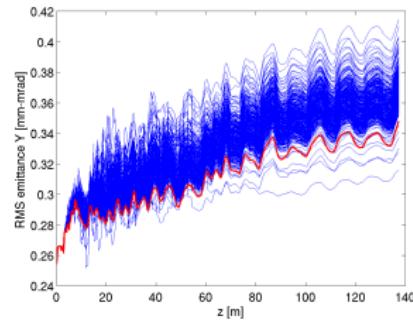


Figure: RMS Emittance X / CW

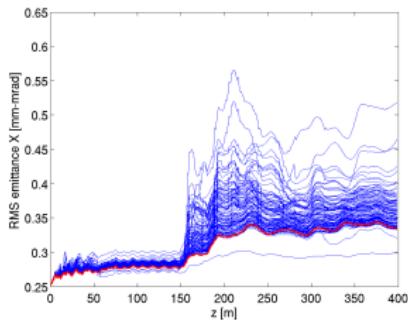
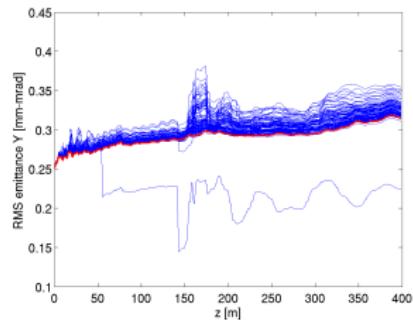


Figure: RMS Emittance Y / CW



(03) Solenoids $\delta_{xy} = 500 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

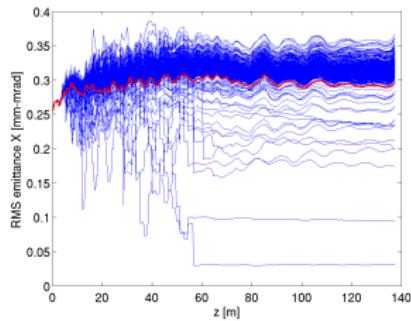


Figure: RMS Emittance Y / Pulsed

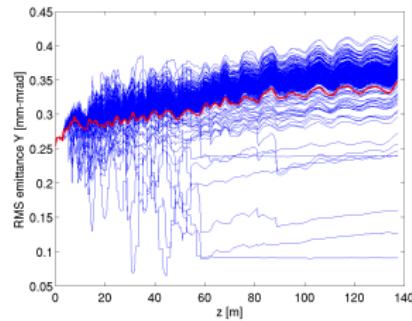


Figure: RMS Emittance X / CW

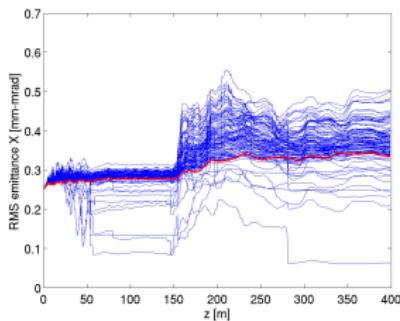
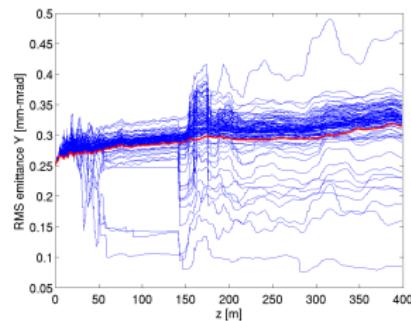


Figure: RMS Emittance Y / CW



(04) Solenoids $\delta_{xy} = 750 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

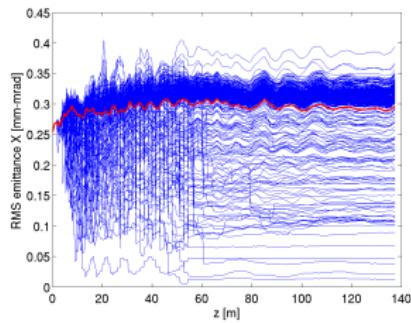


Figure: RMS Emittance Y / Pulsed

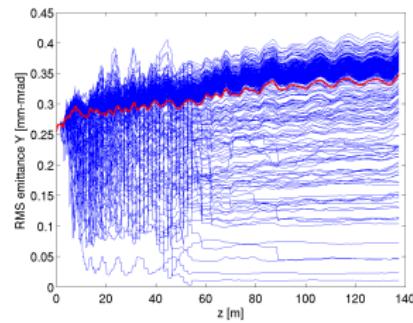


Figure: RMS Emittance X / CW

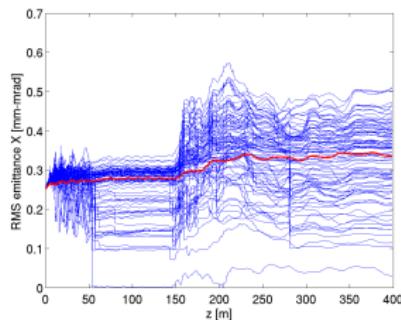
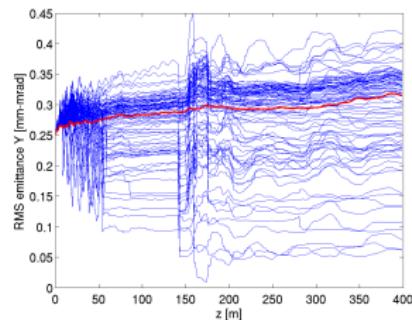


Figure: RMS Emittance Y / CW



(05) Solenoids $\delta_{xy} = 1000 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

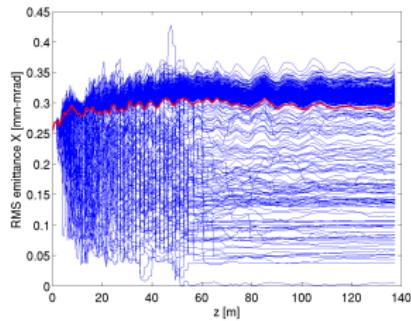


Figure: RMS Emittance Y / Pulsed

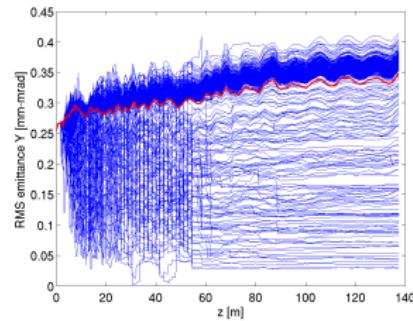


Figure: RMS Emittance X / CW

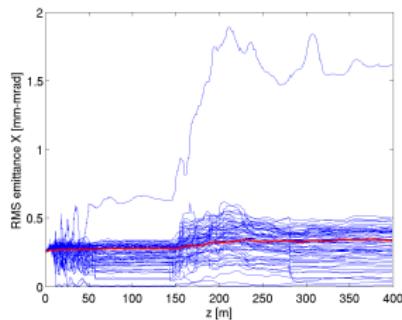
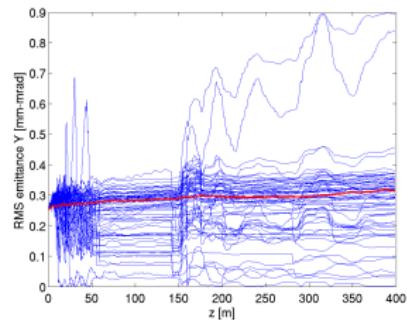


Figure: RMS Emittance Y / CW



(06) Solenoids $\delta_z = 150 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

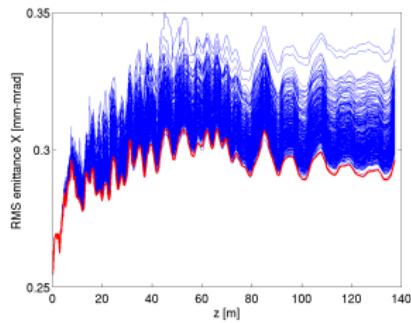


Figure: RMS Emittance Y / Pulsed

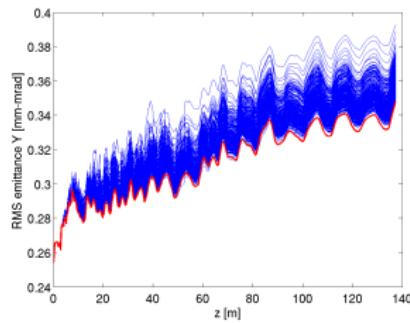


Figure: RMS Emittance X / CW

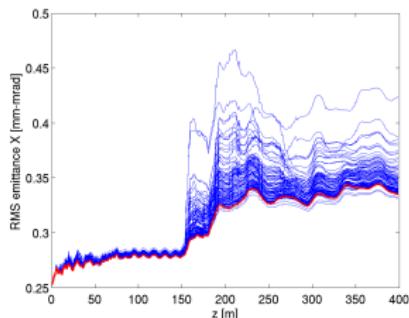
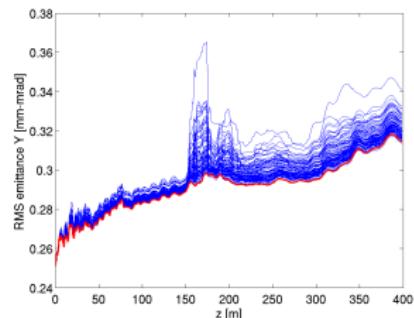


Figure: RMS Emittance Y / CW



(07) Solenoids $\delta_z = 300 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

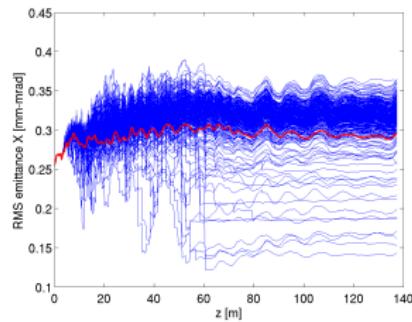


Figure: RMS Emittance Y / Pulsed

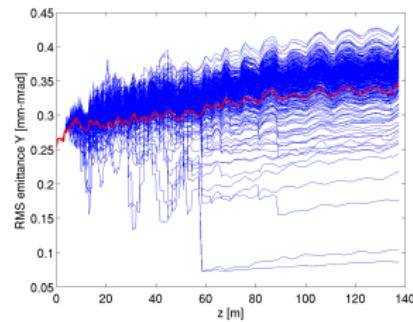


Figure: RMS Emittance X / CW

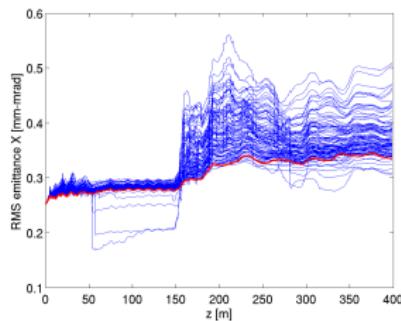
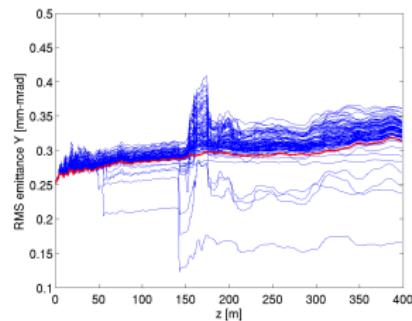


Figure: RMS Emittance Y / CW



(08) Solenoids $\delta_z = 500 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

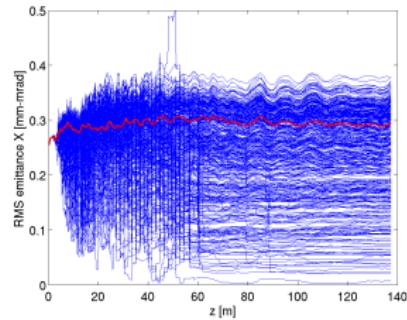


Figure: RMS Emittance Y / Pulsed

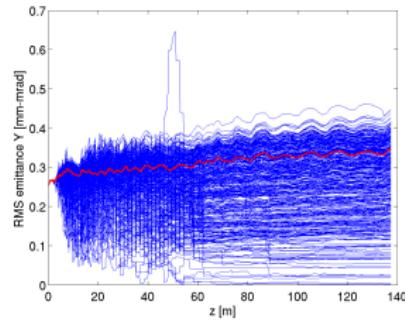


Figure: RMS Emittance X / CW

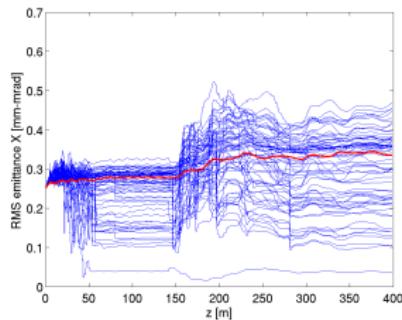
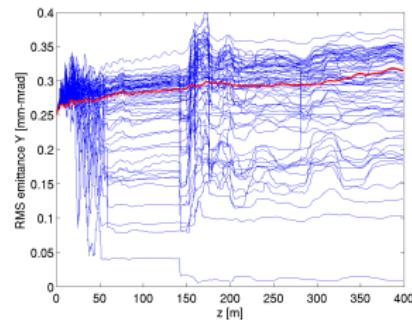


Figure: RMS Emittance Y / CW



(09) Solenoids $\delta_z = 750 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

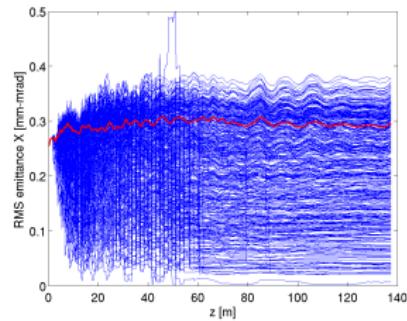


Figure: RMS Emittance Y / Pulsed

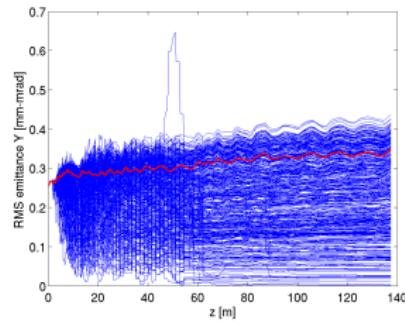


Figure: RMS Emittance X / CW

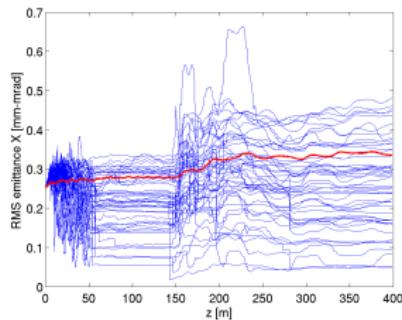
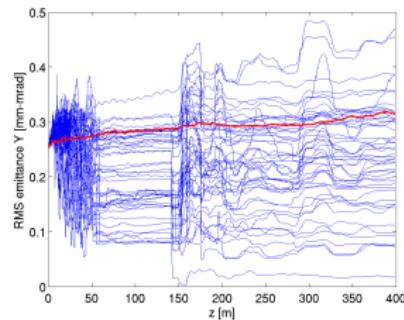


Figure: RMS Emittance Y / CW



(10) Solenoids $\delta_z = 1000 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

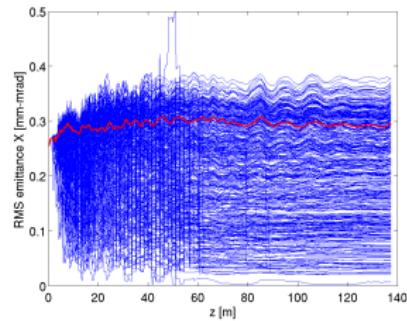


Figure: RMS Emittance Y / Pulsed

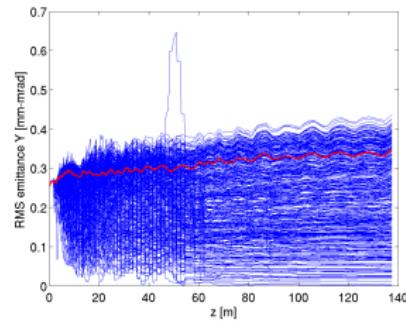


Figure: RMS Emittance X / CW

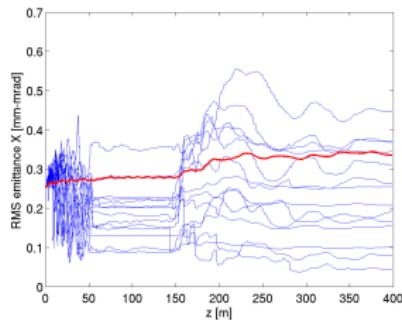
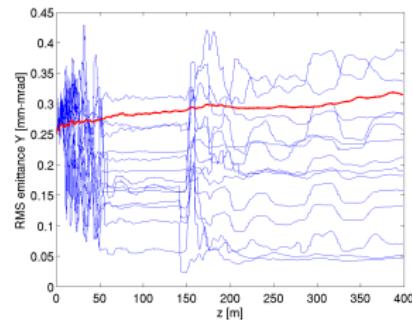


Figure: RMS Emittance Y / CW



(11) Sol. Field $\delta F_{dynamic} = 0.5 \%$

Figure: RMS Emittance X / Pulsed

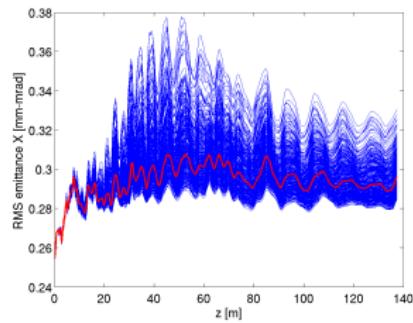


Figure: RMS Emittance Y / Pulsed

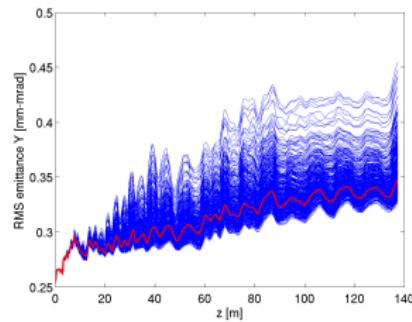


Figure: RMS Emittance X / CW

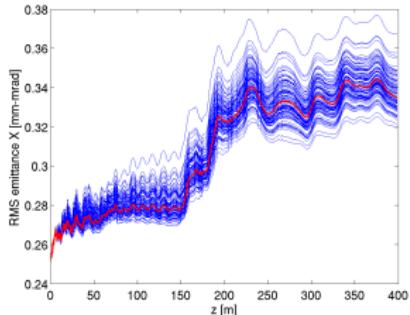
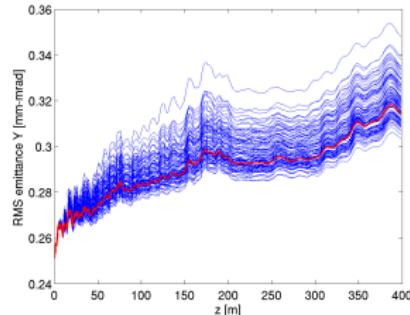


Figure: RMS Emittance Y / CW



(12) Sol. Field $\delta F_{dynamic} = 1.0 \%$

Figure: RMS Emittance X / Pulsed

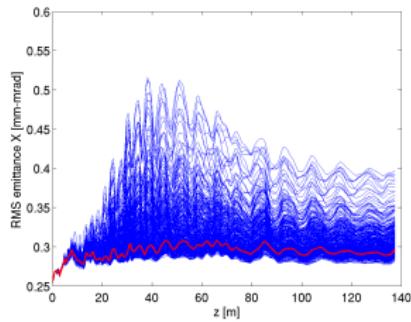


Figure: RMS Emittance Y / Pulsed

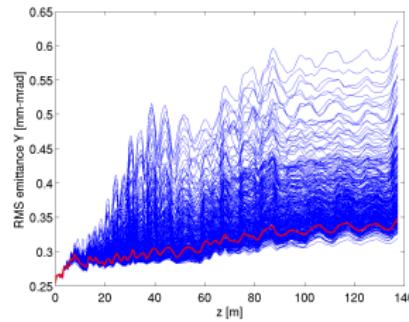


Figure: RMS Emittance X / CW

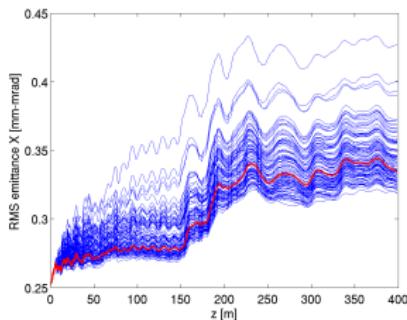
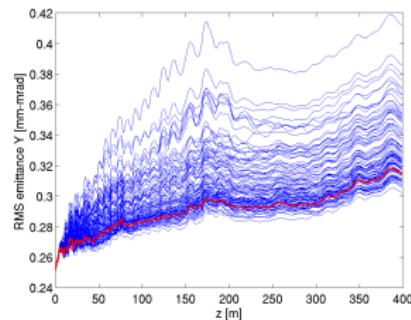


Figure: RMS Emittance Y / CW



(13) Sol. Field $\delta F_{dynamic} = 1.5 \%$

Figure: RMS Emittance X / Pulsed

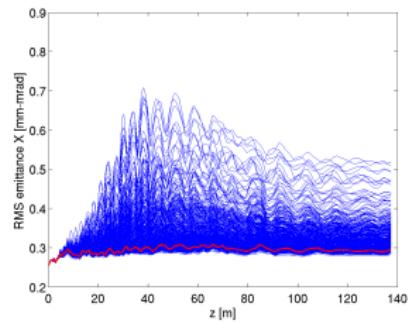


Figure: RMS Emittance Y / Pulsed

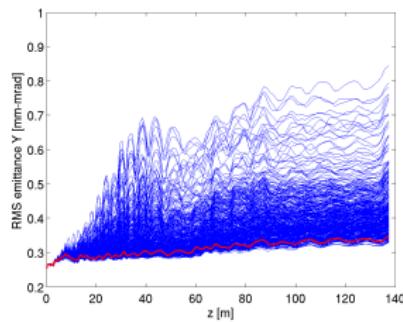


Figure: RMS Emittance X / CW

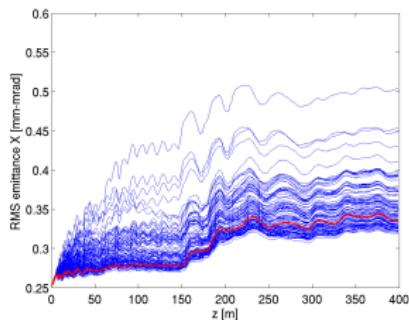
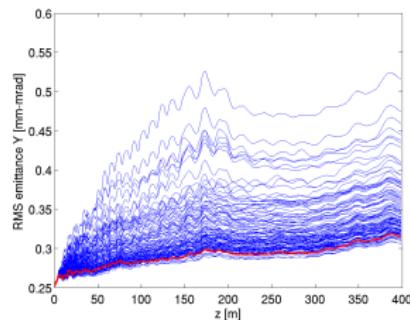


Figure: RMS Emittance Y / CW



(14) Sol. Field $\delta F_{dynamic} = 2.0 \%$

Figure: RMS Emittance X / Pulsed

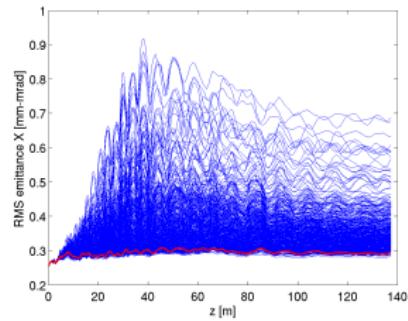


Figure: RMS Emittance Y / Pulsed

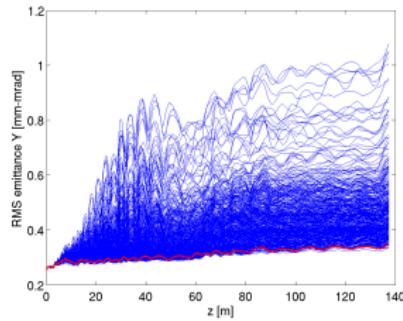


Figure: RMS Emittance X / CW

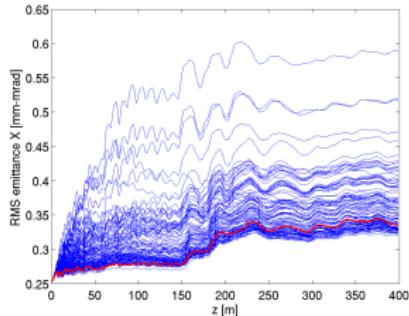
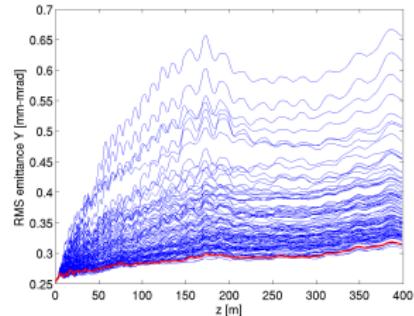


Figure: RMS Emittance Y / CW



(15) Sol. Field $\delta F_{dynamic} = 2.5 \%$

Figure: RMS Emittance X / Pulsed

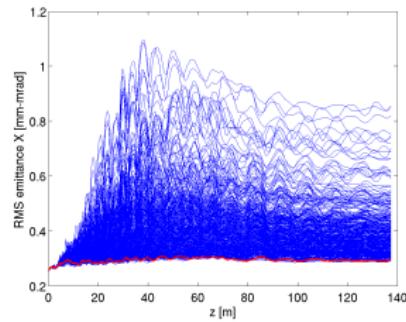


Figure: RMS Emittance Y / Pulsed

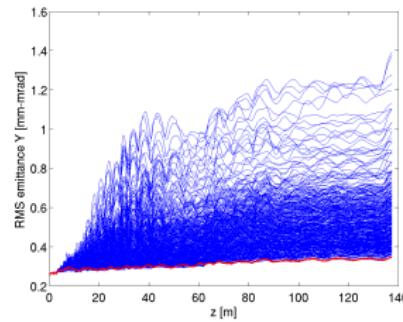


Figure: RMS Emittance X / CW

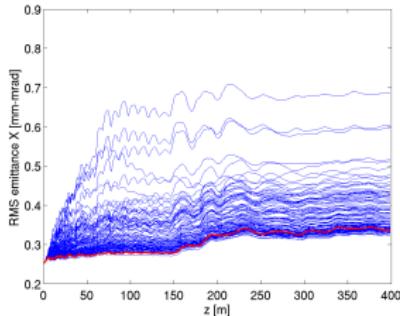
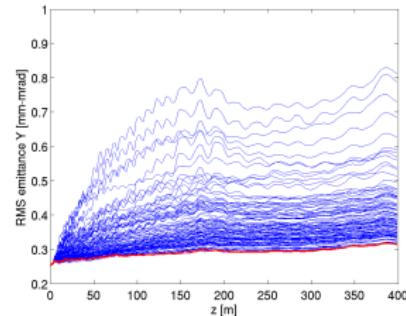


Figure: RMS Emittance Y / CW



(16) Sol. Field $\delta F_{static} = 0.5 \%$

Figure: RMS Emittance X / Pulsed

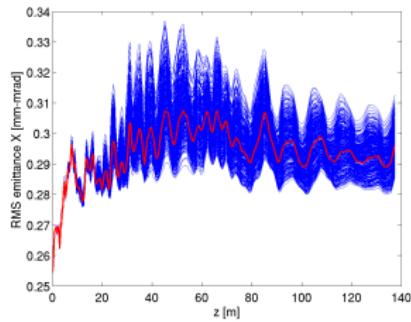


Figure: RMS Emittance Y / Pulsed

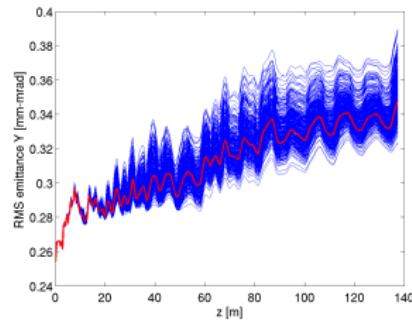


Figure: RMS Emittance X / CW

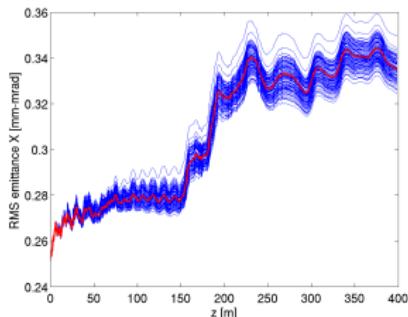
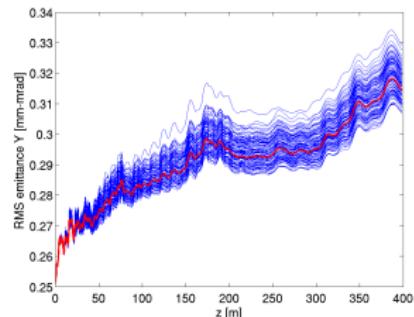


Figure: RMS Emittance Y / CW



(17) Sol. Field $\delta F_{static} = 1.0 \%$

Figure: RMS Emittance X / Pulsed

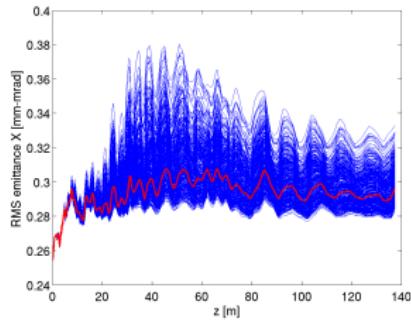


Figure: RMS Emittance Y / Pulsed

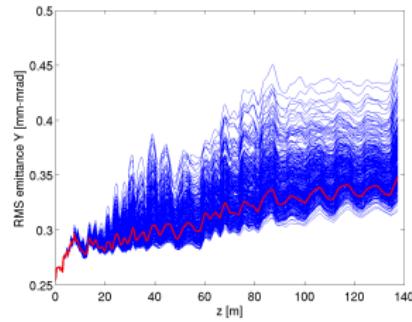


Figure: RMS Emittance X / CW

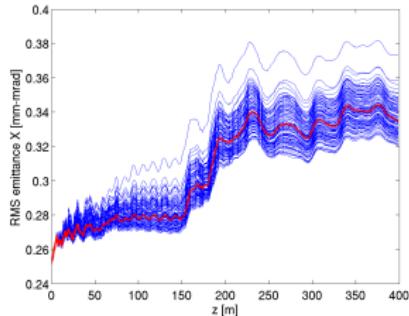
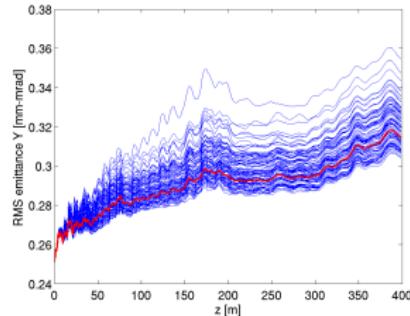


Figure: RMS Emittance Y / CW



(18) Sol. Field $\delta F_{static} = 1.5 \%$

Figure: RMS Emittance X / Pulsed

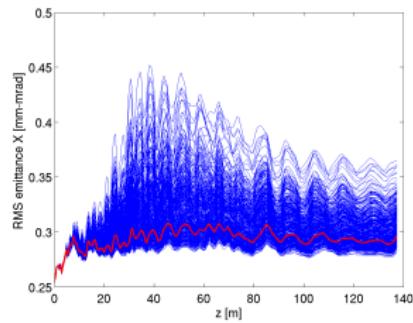


Figure: RMS Emittance Y / Pulsed

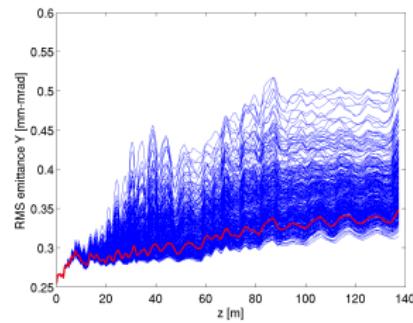


Figure: RMS Emittance X / CW

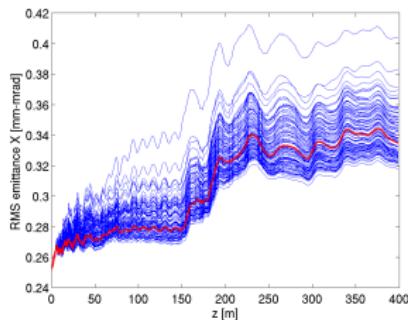
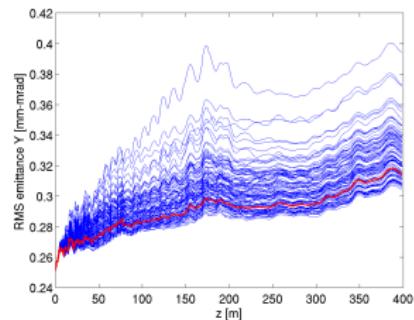


Figure: RMS Emittance Y / CW



(19) Sol. Field $\delta F_{static} = 2.0 \%$

Figure: RMS Emittance X / Pulsed

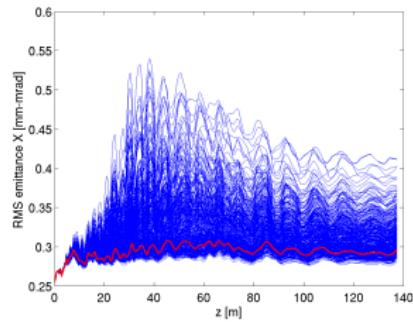


Figure: RMS Emittance Y / Pulsed

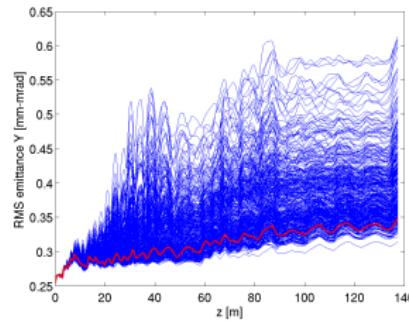


Figure: RMS Emittance X / CW

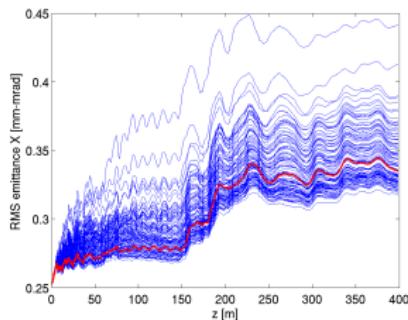
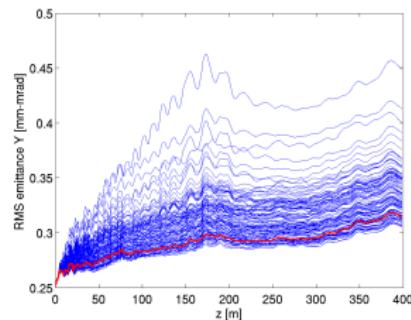


Figure: RMS Emittance Y / CW



(20) Sol. Field $\delta F_{static} = 2.5 \%$

Figure: RMS Emittance X / Pulsed

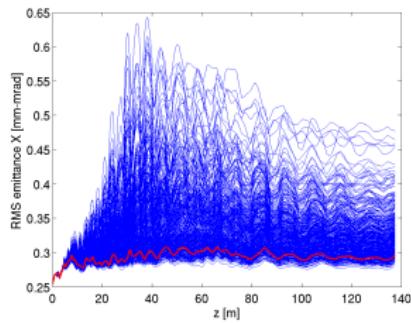


Figure: RMS Emittance Y / Pulsed

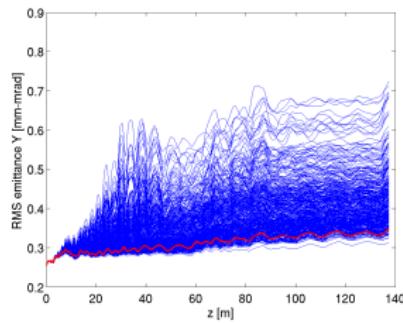


Figure: RMS Emittance X / CW

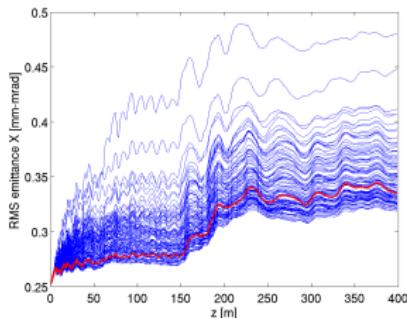
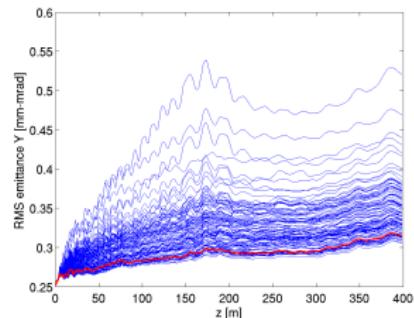


Figure: RMS Emittance Y / CW



(21) Quads $\delta_{xy} = 150 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

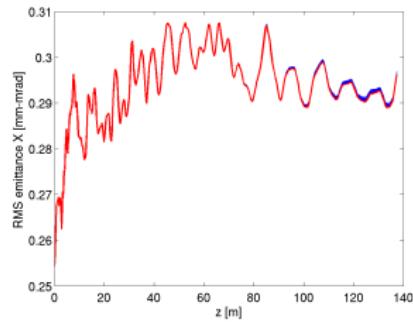


Figure: RMS Emittance Y / Pulsed

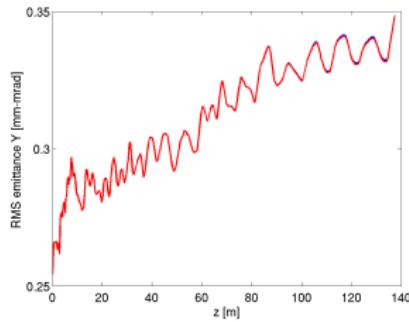


Figure: RMS Emittance X / CW

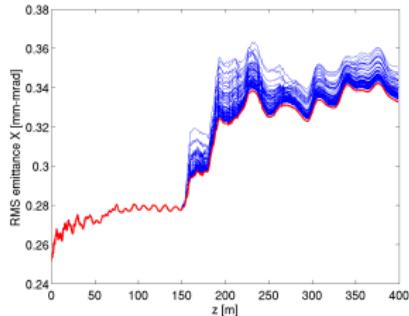
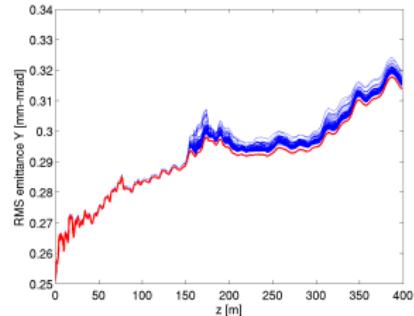


Figure: RMS Emittance Y / CW



(22) Quads $\delta_{xy} = 300 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

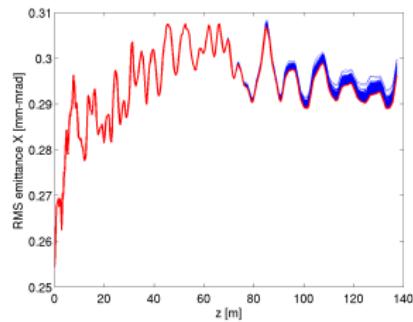


Figure: RMS Emittance Y / Pulsed

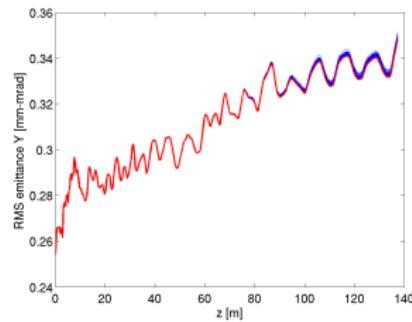


Figure: RMS Emittance X / CW

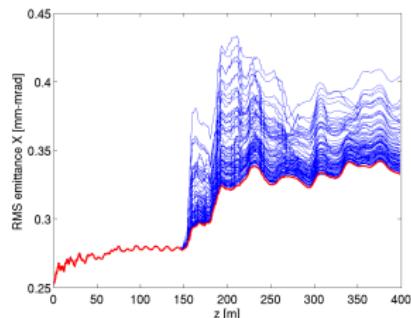
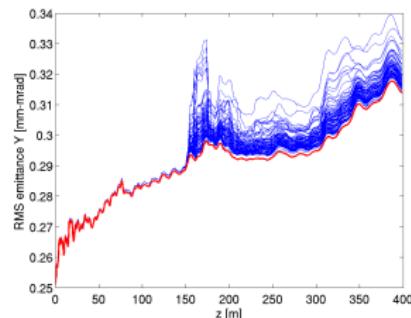


Figure: RMS Emittance Y / CW



(23) Quads $\delta_{xy} = 500 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

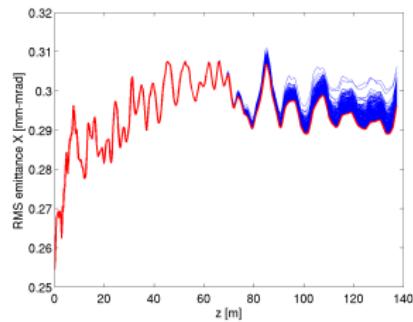


Figure: RMS Emittance Y / Pulsed

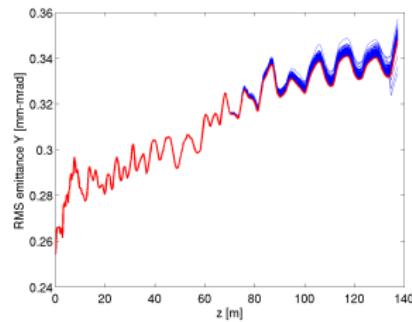


Figure: RMS Emittance X / CW

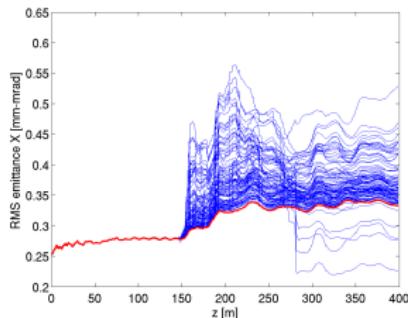
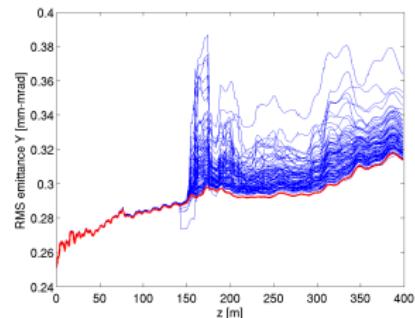


Figure: RMS Emittance Y / CW



(24) Quads $\delta_{xy} = 750 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

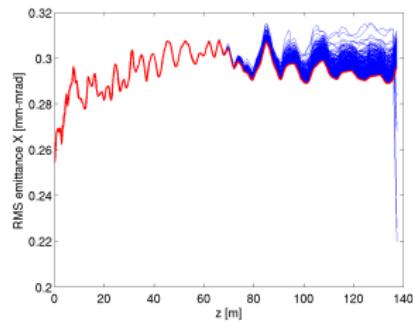


Figure: RMS Emittance Y / Pulsed

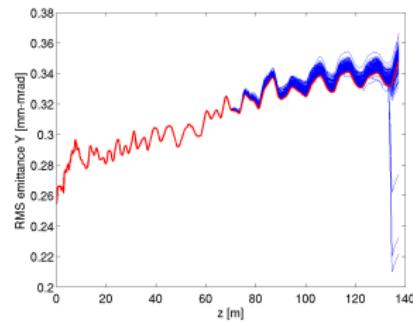


Figure: RMS Emittance X / CW

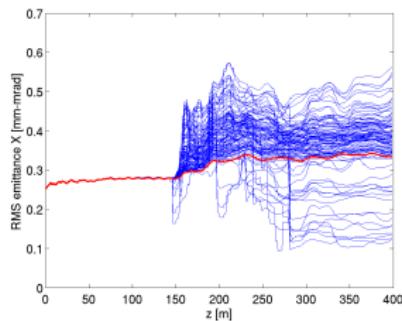
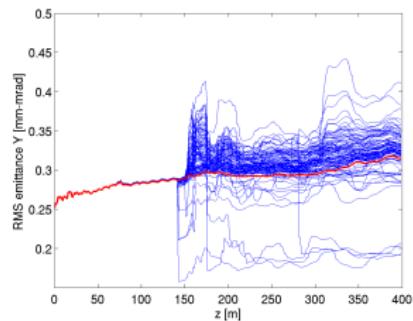


Figure: RMS Emittance Y / CW



(25) Quads $\delta_{xy} = 1000 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

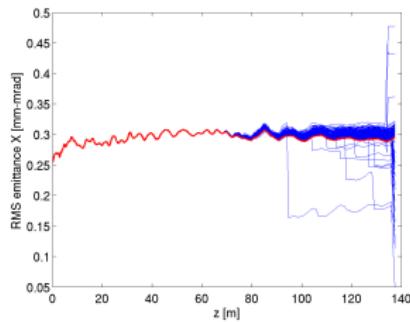


Figure: RMS Emittance Y / Pulsed

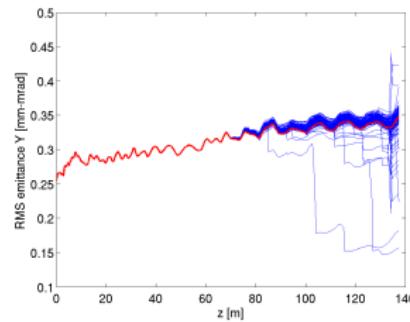


Figure: RMS Emittance X / CW

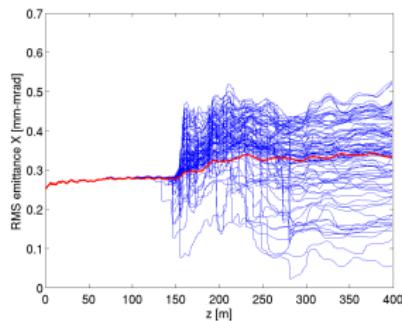
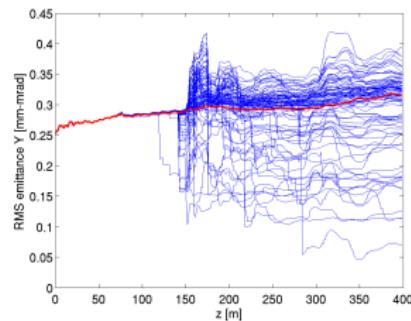


Figure: RMS Emittance Y / CW



(26) Quads $\delta_z = 150 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

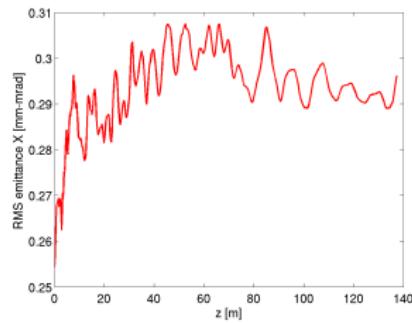


Figure: RMS Emittance Y / Pulsed

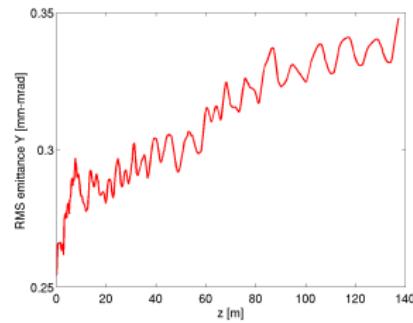


Figure: RMS Emittance X / CW

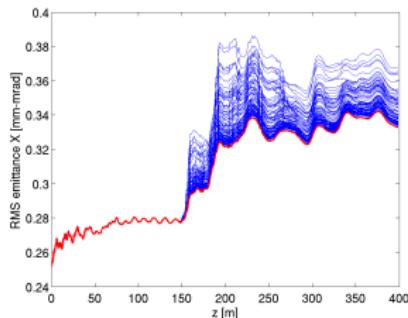
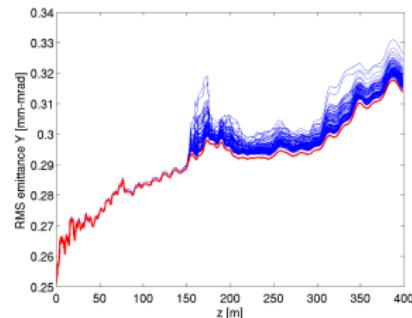


Figure: RMS Emittance Y / CW



(27) Quads $\delta_z = 300 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

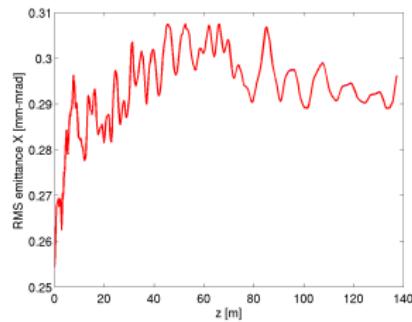


Figure: RMS Emittance Y / Pulsed

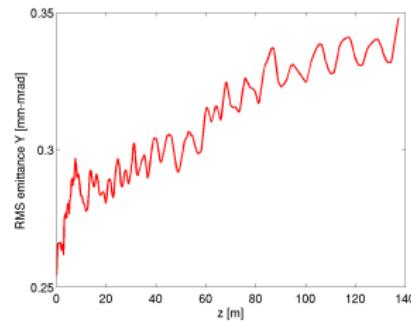


Figure: RMS Emittance X / CW

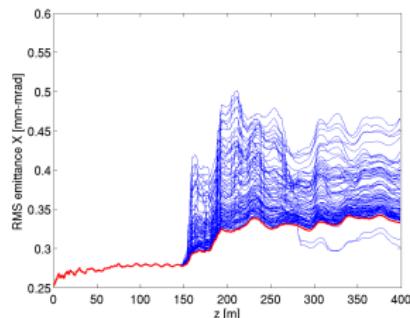
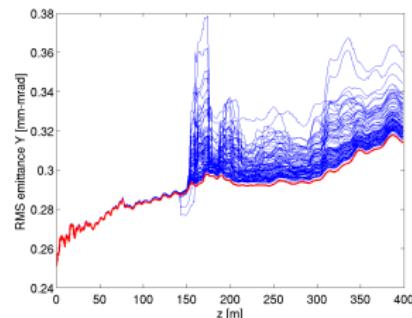


Figure: RMS Emittance Y / CW



(28) Quads $\delta_z = 500 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

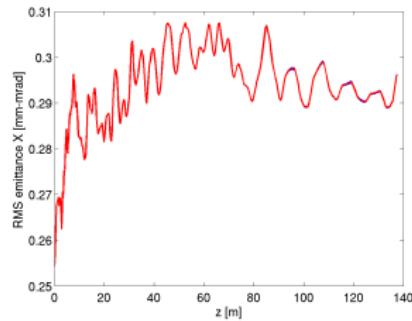


Figure: RMS Emittance Y / Pulsed

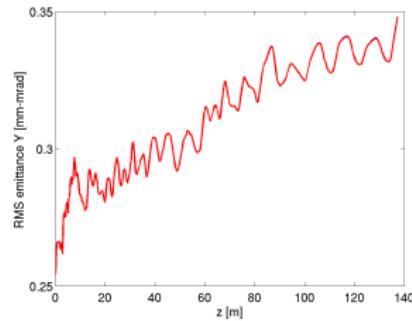


Figure: RMS Emittance X / CW

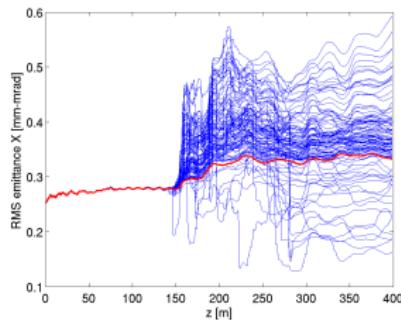
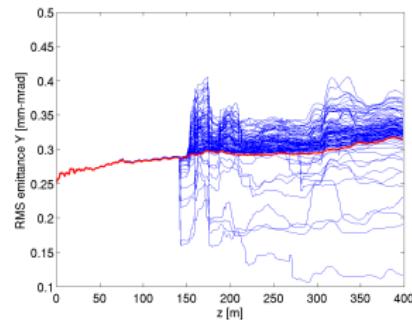


Figure: RMS Emittance Y / CW



(29) Quads $\delta_z = 750 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

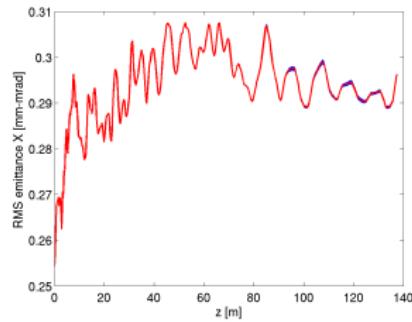


Figure: RMS Emittance Y / Pulsed

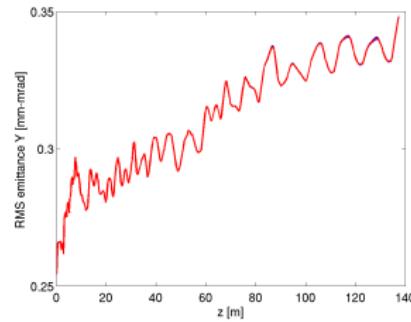


Figure: RMS Emittance X / CW

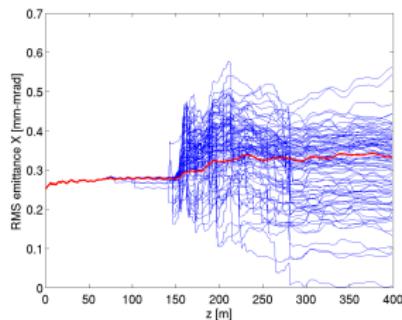
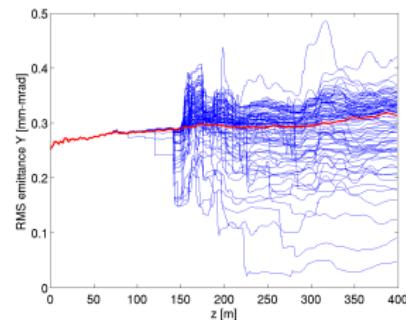


Figure: RMS Emittance Y / CW



(30) Quads $\delta_z = 1000 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

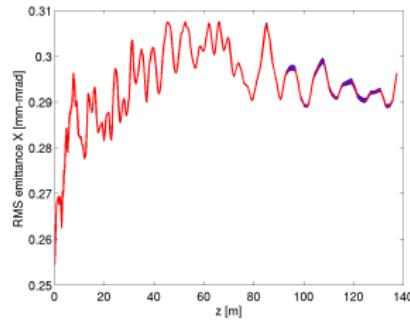


Figure: RMS Emittance Y / Pulsed

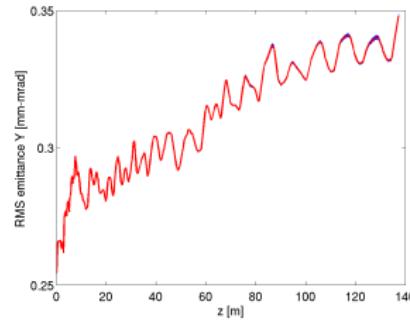


Figure: RMS Emittance X / CW

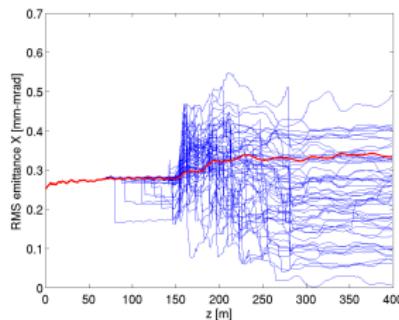
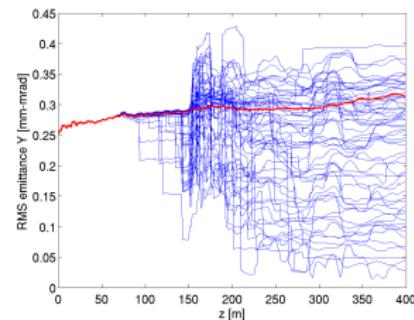


Figure: RMS Emittance Y / CW



(31) Quads $\phi_z = 1$ mrad

Figure: RMS Emittance X / Pulsed

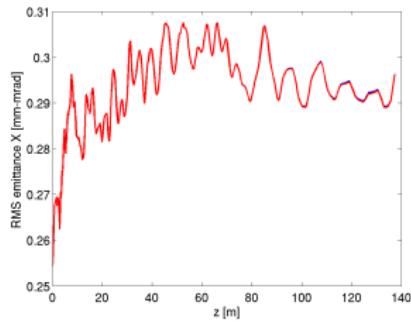


Figure: RMS Emittance Y / Pulsed

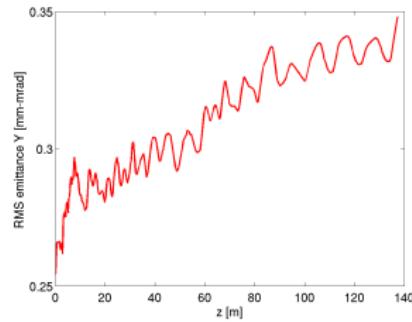


Figure: RMS Emittance X / CW

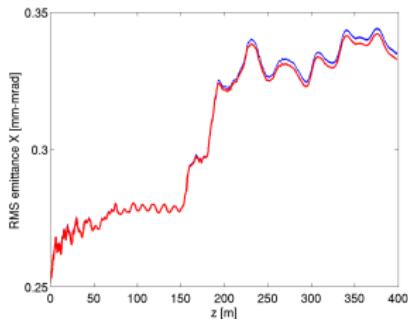
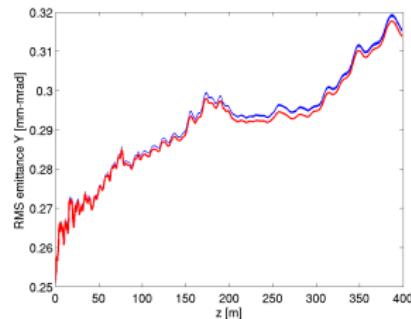


Figure: RMS Emittance Y / CW



(32) Quads $\phi_z = 2$ mrad

Figure: RMS Emittance X / Pulsed

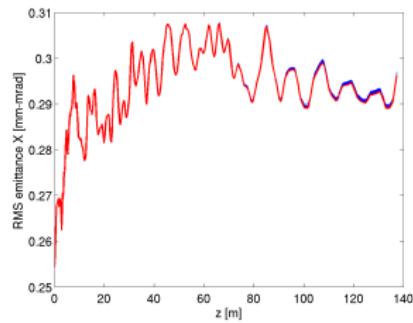


Figure: RMS Emittance Y / Pulsed

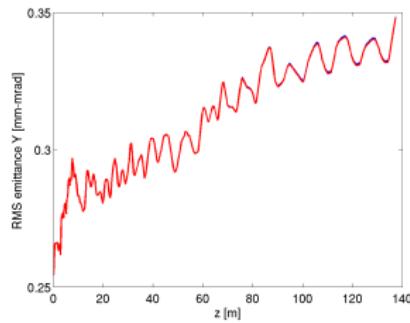


Figure: RMS Emittance X / CW

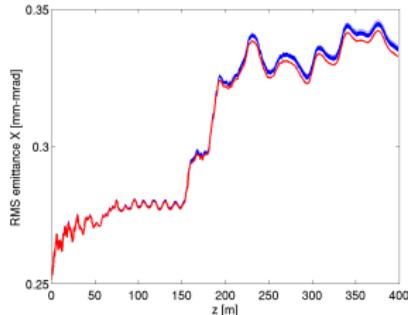
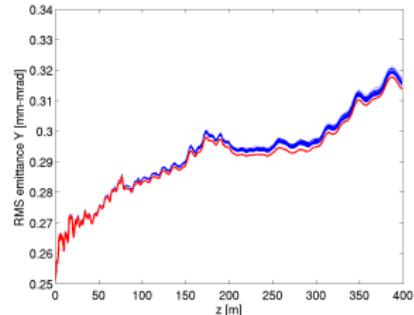


Figure: RMS Emittance Y / CW



(33) Quads $\phi_z = 5$ mrad

Figure: RMS Emittance X / Pulsed

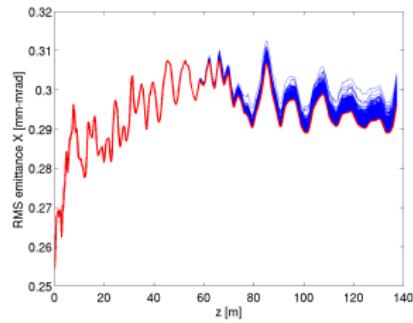


Figure: RMS Emittance Y / Pulsed

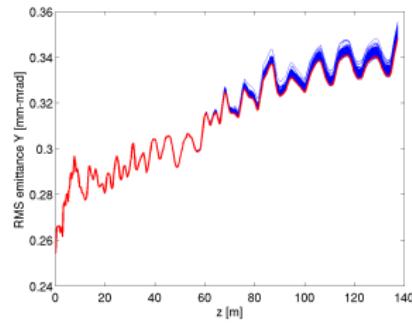


Figure: RMS Emittance X / CW

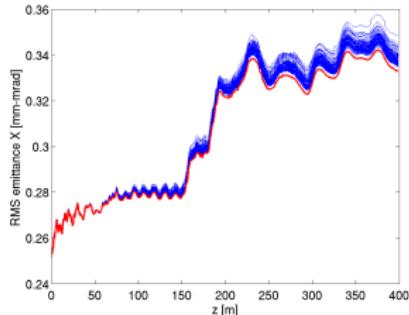
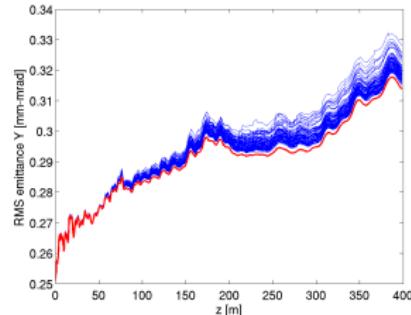


Figure: RMS Emittance Y / CW



(34) Quads $\phi_z = 7$ mrad

Figure: RMS Emittance X / Pulsed

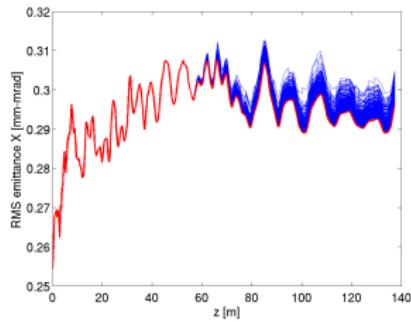


Figure: RMS Emittance Y / Pulsed

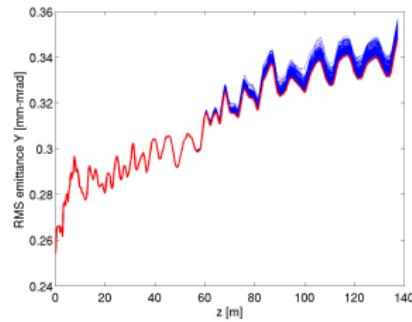


Figure: RMS Emittance X / CW

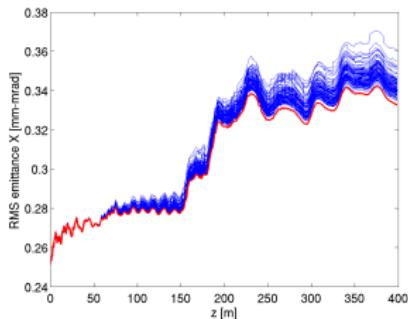
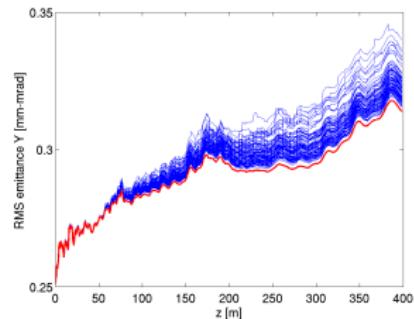


Figure: RMS Emittance Y / CW



(35) Quads $\phi_z = 10$ mrad

Figure: RMS Emittance X / Pulsed

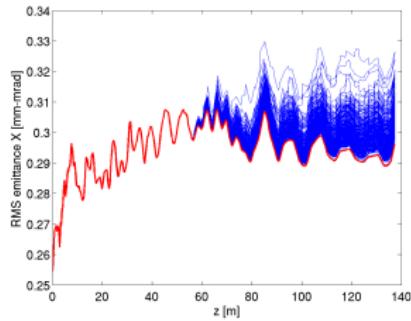


Figure: RMS Emittance Y / Pulsed

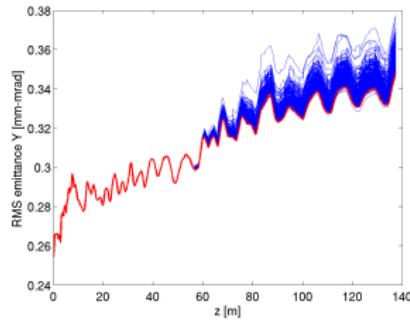


Figure: RMS Emittance X / CW

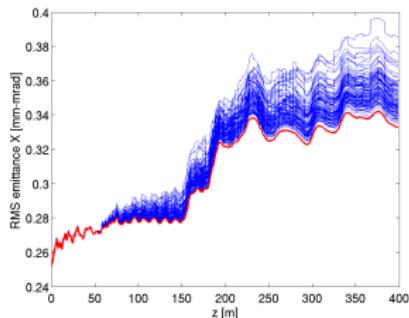
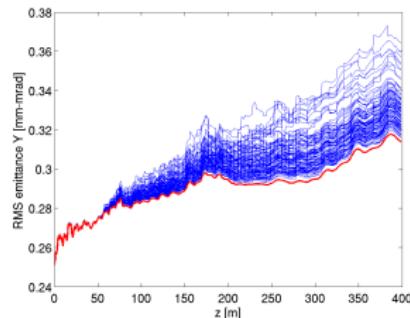


Figure: RMS Emittance Y / CW



(36) Quads Field $\delta F_{dynamic} = 0.5 \%$

Figure: RMS Emittance X / Pulsed

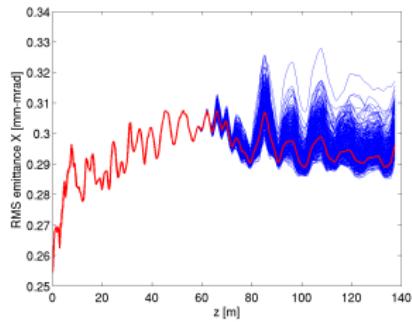


Figure: RMS Emittance Y / Pulsed

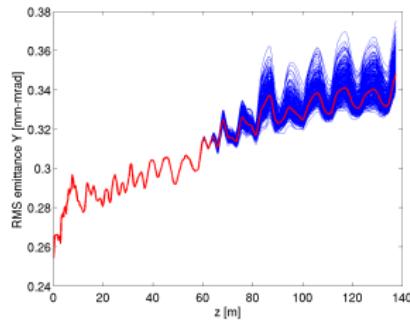


Figure: RMS Emittance X / CW

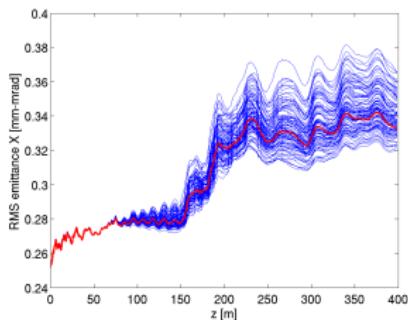
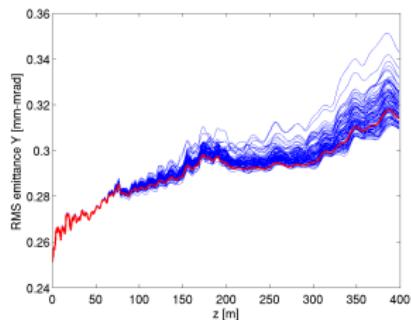


Figure: RMS Emittance Y / CW



(37) Quads Field $\delta F_{dynamic} = 1.0 \%$

Figure: RMS Emittance X / Pulsed

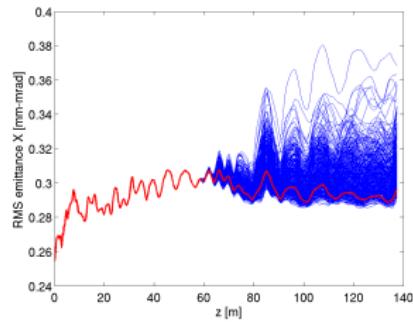


Figure: RMS Emittance Y / Pulsed

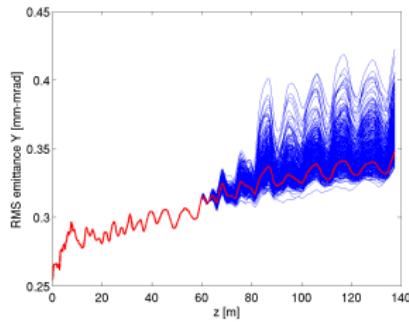


Figure: RMS Emittance X / CW

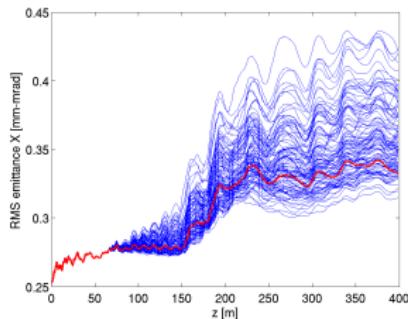
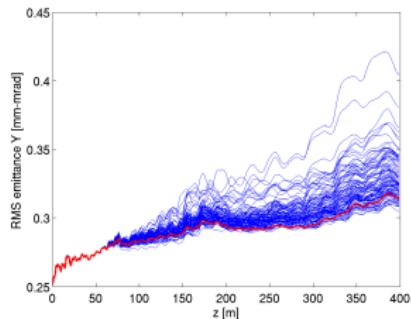


Figure: RMS Emittance Y / CW



(38) Quads Field $\delta F_{dynamic} = 1.5 \%$

Figure: RMS Emittance X / Pulsed

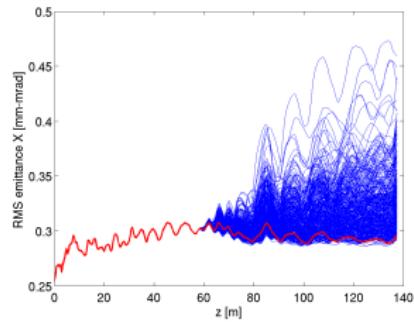


Figure: RMS Emittance Y / Pulsed

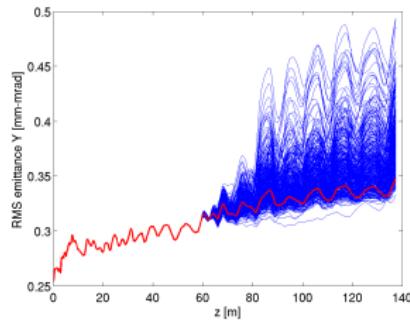


Figure: RMS Emittance X / CW

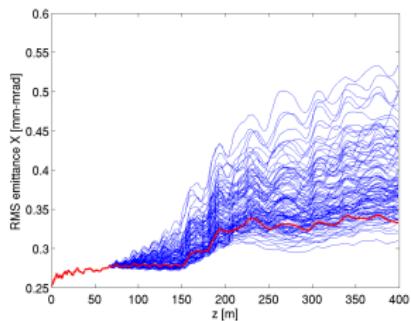
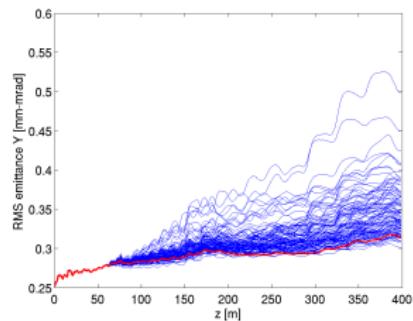


Figure: RMS Emittance Y / CW



(39) Quads Field $\delta F_{dynamic} = 2.0 \%$

Figure: RMS Emittance X / Pulsed

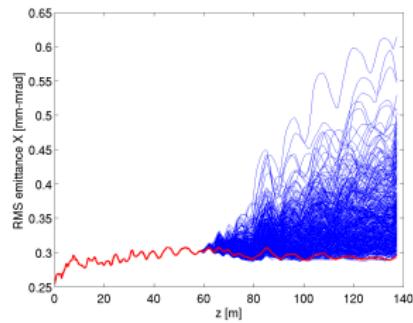


Figure: RMS Emittance Y / Pulsed

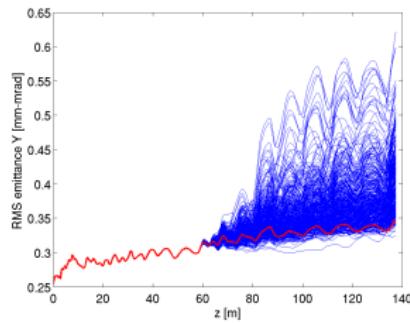


Figure: RMS Emittance X / CW

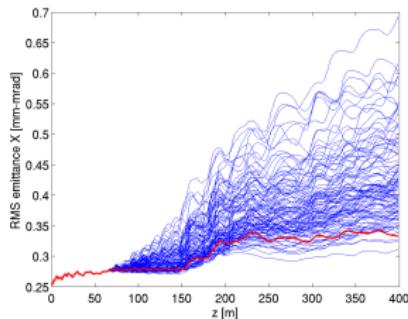
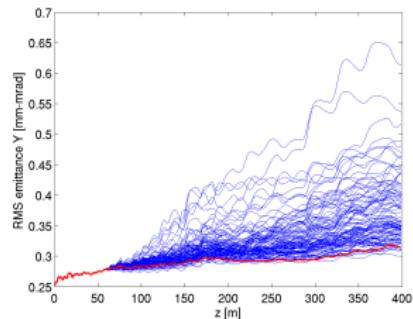


Figure: RMS Emittance Y / CW



(40) Quads Field $\delta F_{dynamic} = 2.5 \%$

Figure: RMS Emittance X / Pulsed

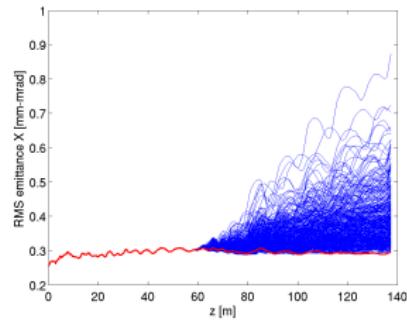


Figure: RMS Emittance Y / Pulsed

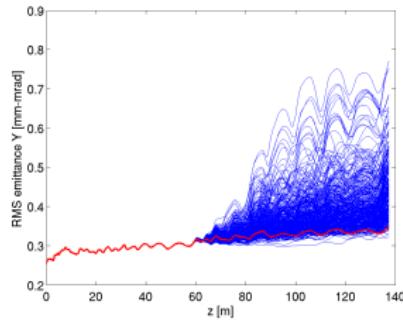


Figure: RMS Emittance X / CW

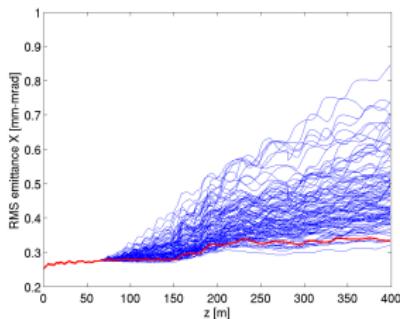
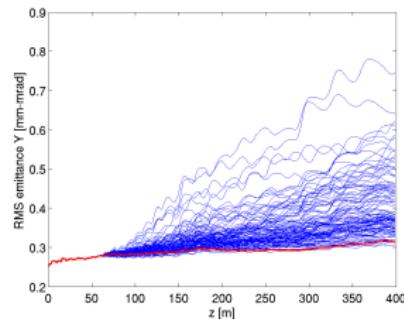


Figure: RMS Emittance Y / CW



(41) Quads Field $\delta F_{static} = 0.5 \%$

Figure: RMS Emittance X / Pulsed

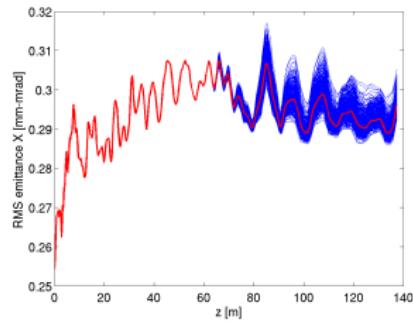


Figure: RMS Emittance Y / Pulsed

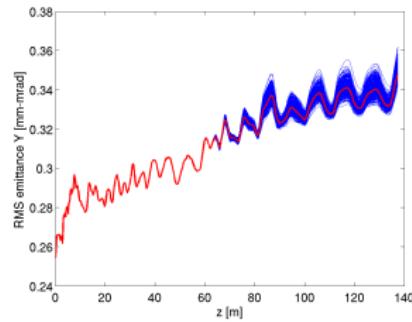


Figure: RMS Emittance X / CW

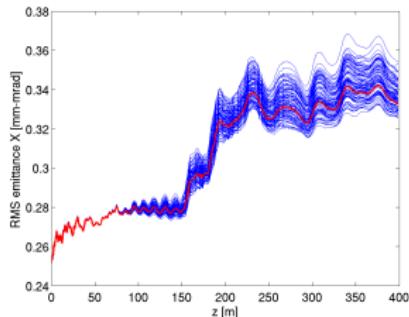
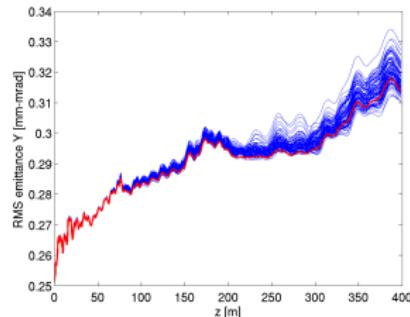


Figure: RMS Emittance Y / CW



(42) Quads Field $\delta F_{static} = 1.0 \%$

Figure: RMS Emittance X / Pulsed

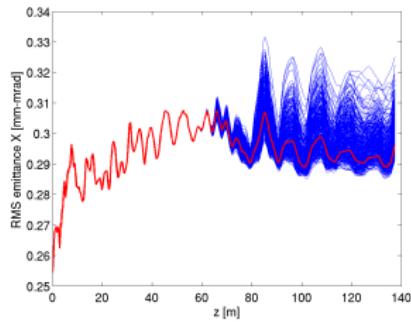


Figure: RMS Emittance Y / Pulsed

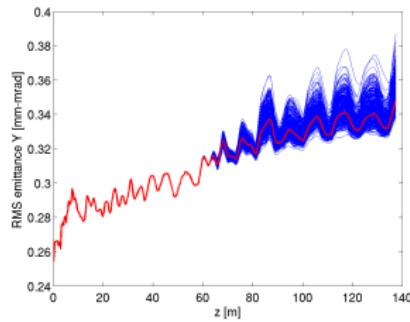


Figure: RMS Emittance X / CW

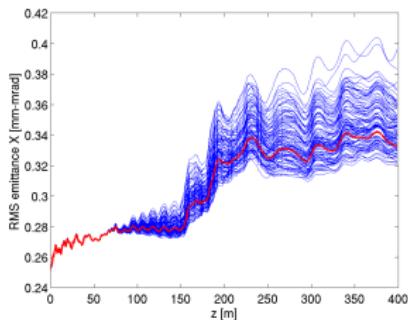
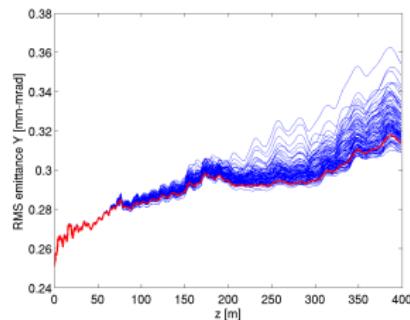


Figure: RMS Emittance Y / CW



(43) Quads Field $\delta F_{static} = 1.5 \%$

Figure: RMS Emittance X / Pulsed

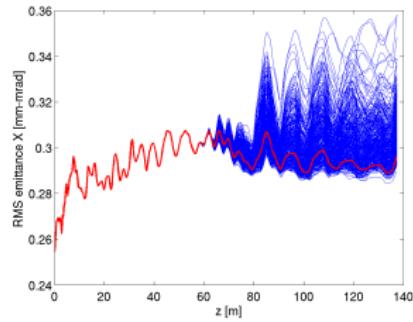


Figure: RMS Emittance Y / Pulsed

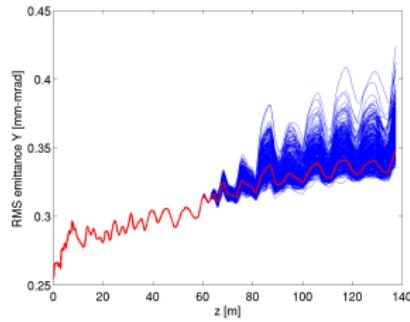


Figure: RMS Emittance X / CW

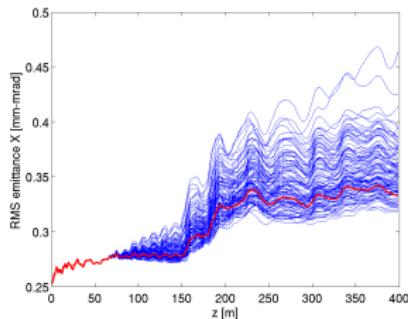
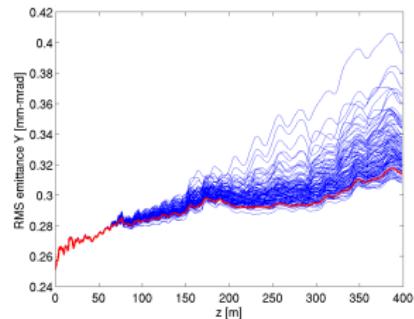


Figure: RMS Emittance Y / CW



(44) Quads Field $\delta F_{static} = 2.0 \%$

Figure: RMS Emittance X / Pulsed

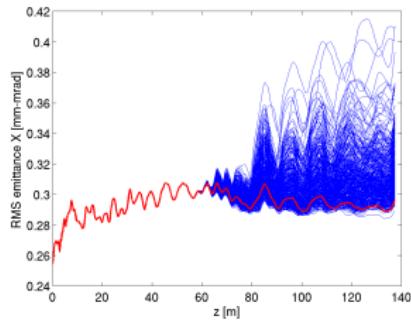


Figure: RMS Emittance Y / Pulsed

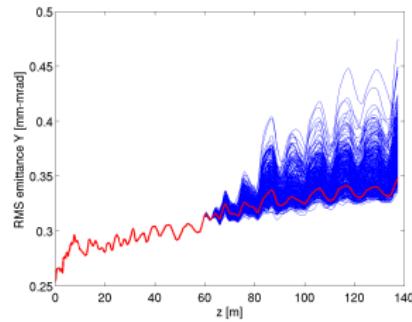


Figure: RMS Emittance X / CW

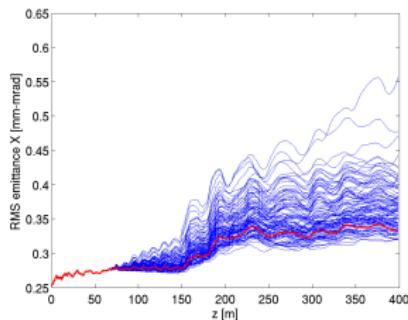
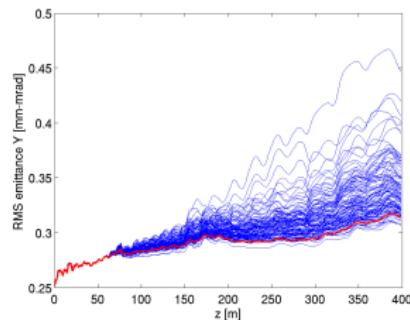


Figure: RMS Emittance Y / CW



(45) Quads Field $\delta F_{static} = 2.5 \%$

Figure: RMS Emittance X / Pulsed

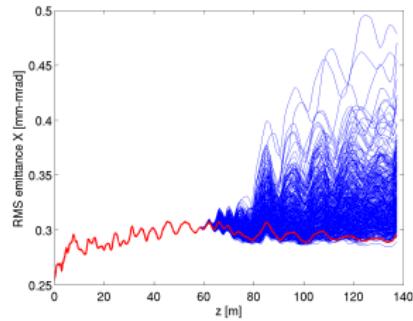


Figure: RMS Emittance Y / Pulsed

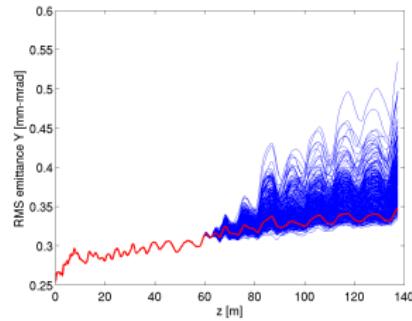


Figure: RMS Emittance X / CW

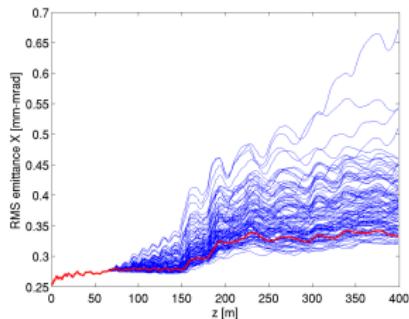
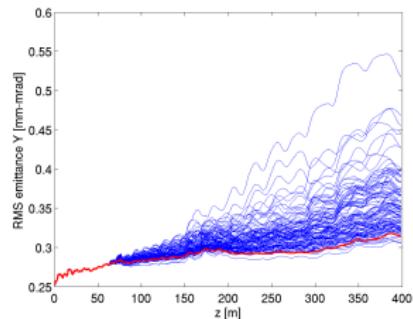


Figure: RMS Emittance Y / CW



(46) Cav. $\delta_{xy} = 150 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

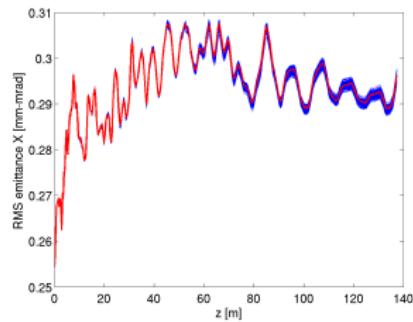


Figure: RMS Emittance Y / Pulsed

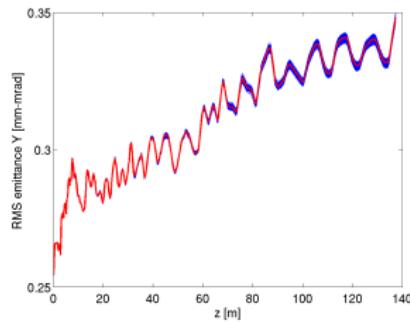


Figure: RMS Emittance X / CW

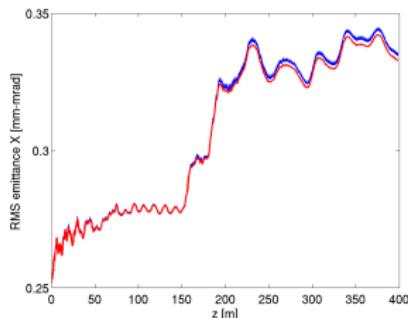
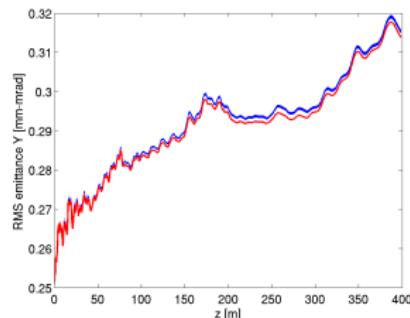


Figure: RMS Emittance Y / CW



(47) Cav. $\delta_{xy} = 300 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

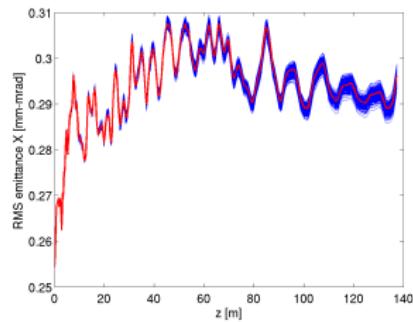


Figure: RMS Emittance Y / Pulsed

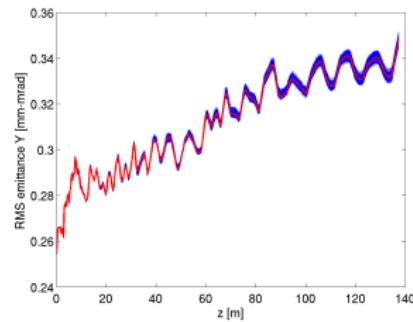


Figure: RMS Emittance X / CW

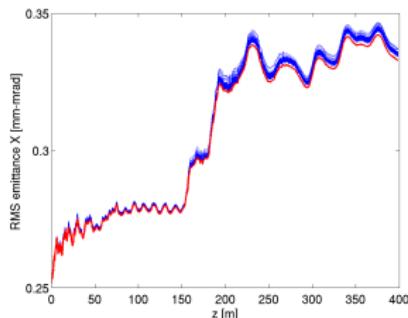
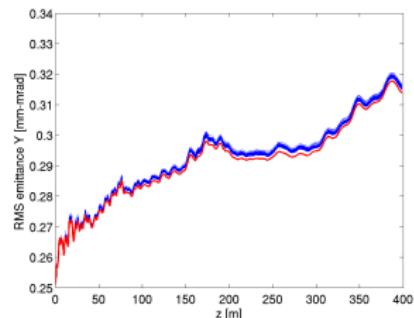


Figure: RMS Emittance Y / CW



(48) Cav. $\delta_{xy} = 500 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

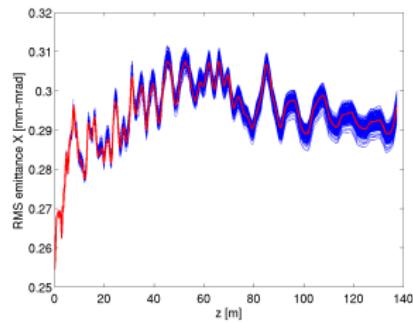


Figure: RMS Emittance Y / Pulsed

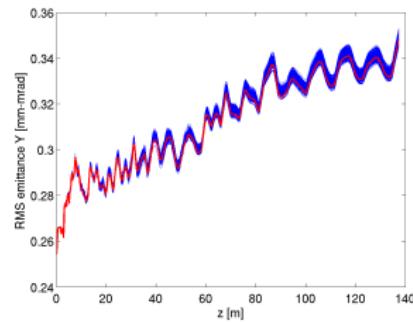


Figure: RMS Emittance X / CW

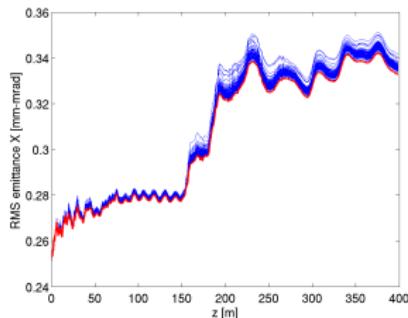
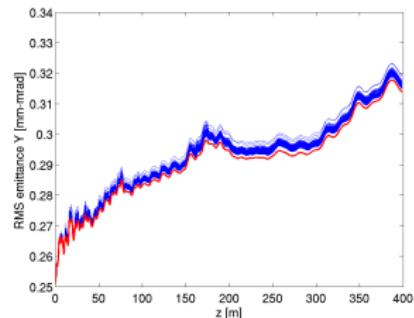


Figure: RMS Emittance Y / CW



(49) Cav. $\delta_{xy} = 750 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

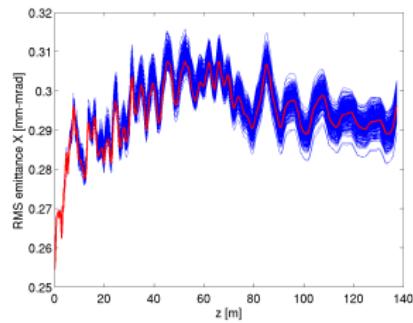


Figure: RMS Emittance Y / Pulsed

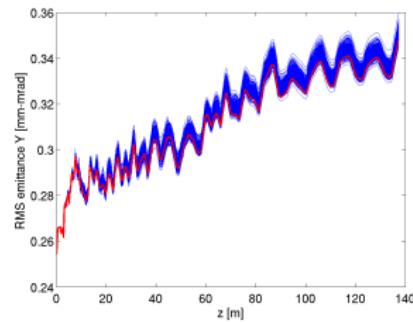


Figure: RMS Emittance X / CW

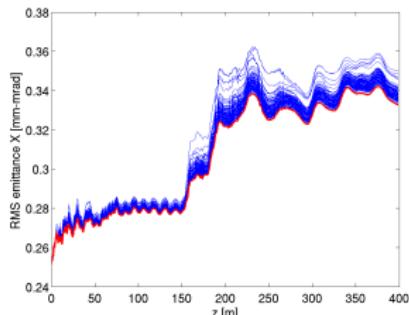
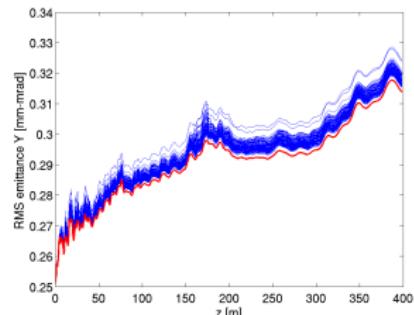


Figure: RMS Emittance Y / CW



(50) Cav. $\delta_{xy} = 1000 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

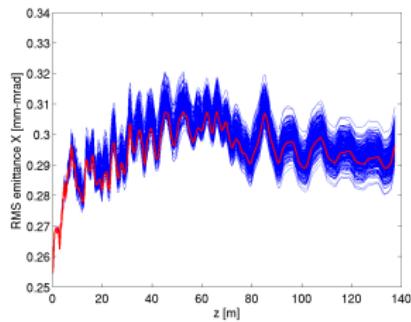


Figure: RMS Emittance Y / Pulsed

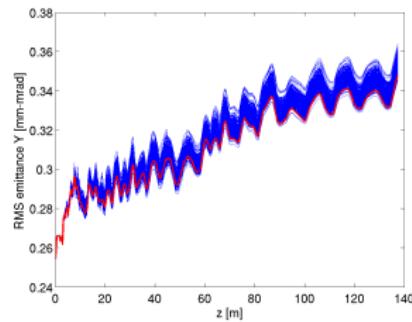


Figure: RMS Emittance X / CW

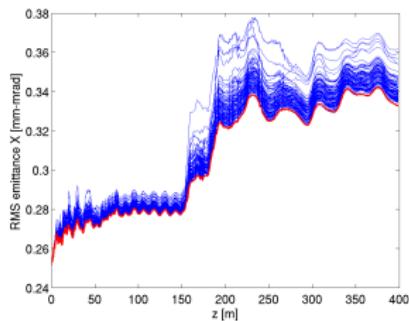
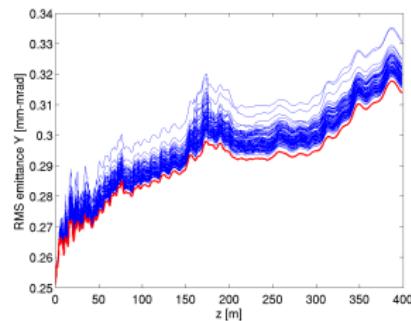


Figure: RMS Emittance Y / CW



(51) Cav. $\delta_z = 150 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

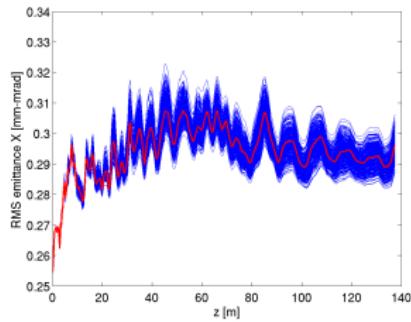


Figure: RMS Emittance Y / Pulsed

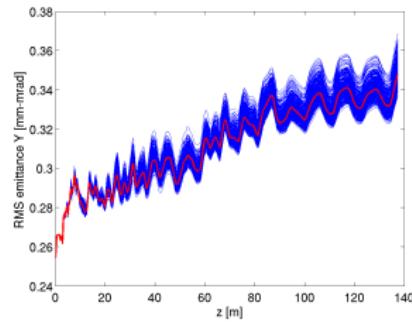


Figure: RMS Emittance X / CW

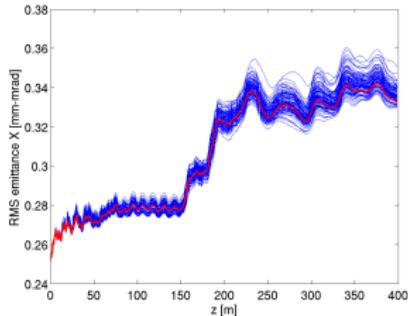
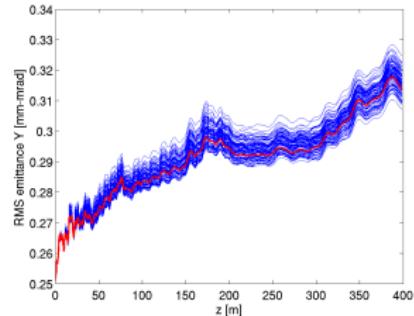


Figure: RMS Emittance Y / CW



(52) Cav. $\delta_z = 300 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

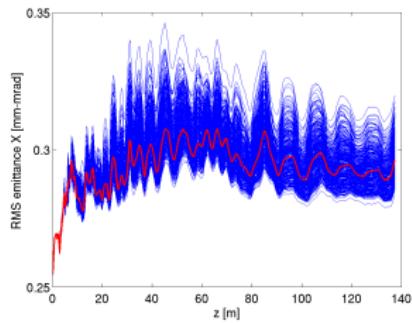


Figure: RMS Emittance Y / Pulsed

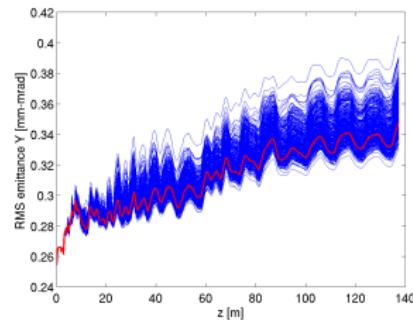


Figure: RMS Emittance X / CW

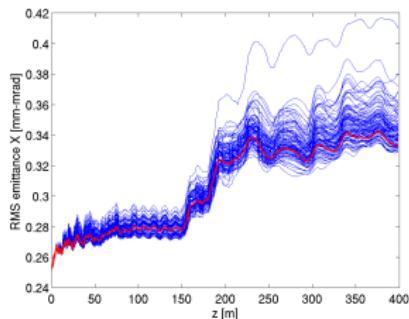
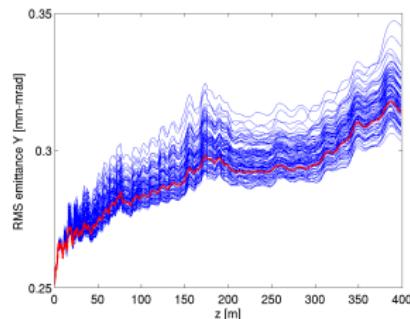


Figure: RMS Emittance Y / CW



(53) Cav. $\delta_z = 500 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

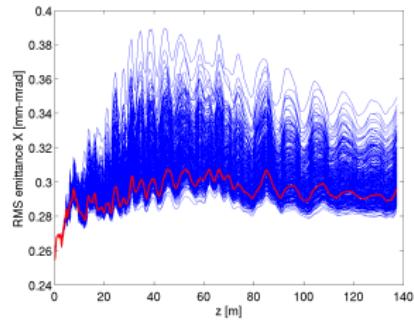


Figure: RMS Emittance Y / Pulsed

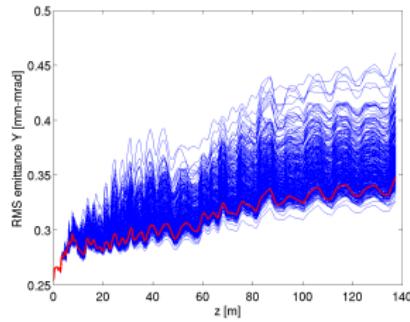


Figure: RMS Emittance X / CW

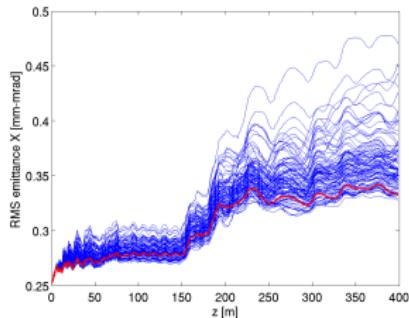
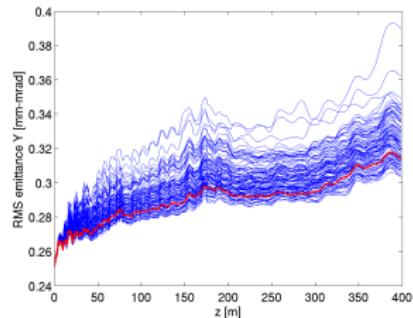


Figure: RMS Emittance Y / CW



(54) Cav. $\delta_z = 750 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

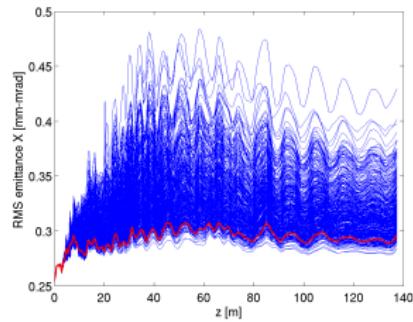


Figure: RMS Emittance Y / Pulsed

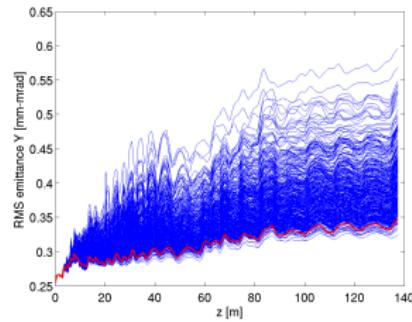


Figure: RMS Emittance X / CW

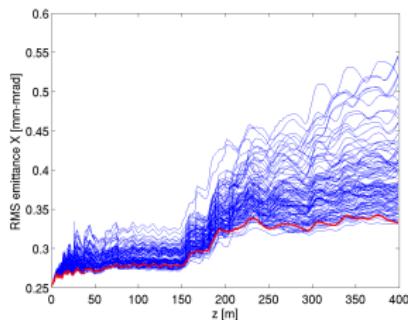
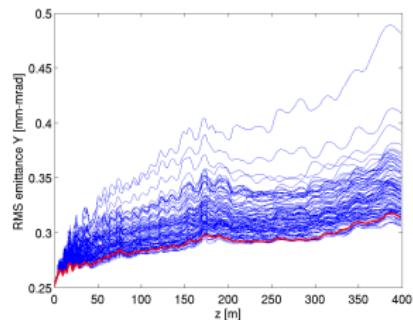


Figure: RMS Emittance Y / CW



(55) Cav. $\delta_z = 1000 \mu\text{m}$

Figure: RMS Emittance X / Pulsed

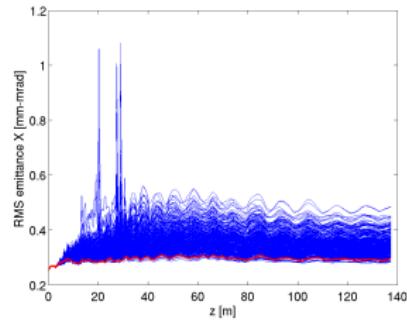


Figure: RMS Emittance Y / Pulsed

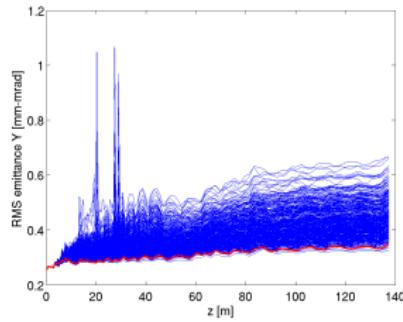


Figure: RMS Emittance X / CW

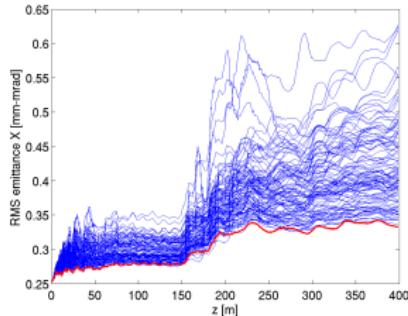
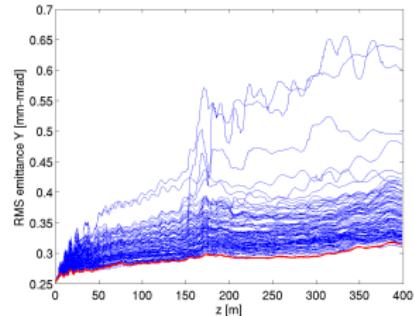


Figure: RMS Emittance Y / CW



(56) Cavities $\phi_z = 1$ mrad

Figure: RMS Emittance X / Pulsed

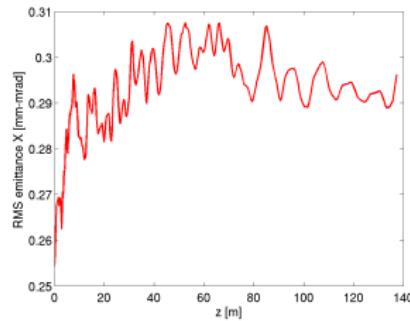


Figure: RMS Emittance Y / Pulsed

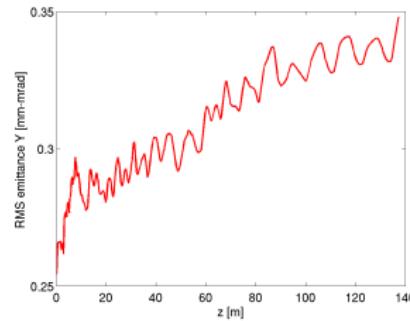


Figure: RMS Emittance X / CW

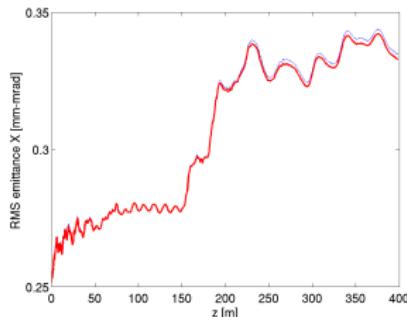
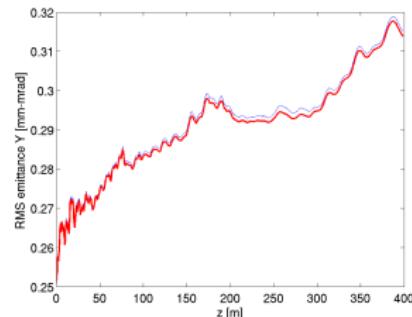


Figure: RMS Emittance Y / CW



(57) Cavities $\phi_z = 2$ mrad

Figure: RMS Emittance X / Pulsed

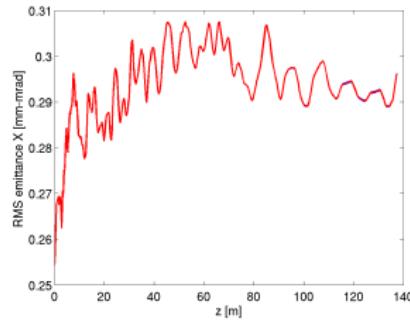


Figure: RMS Emittance Y / Pulsed

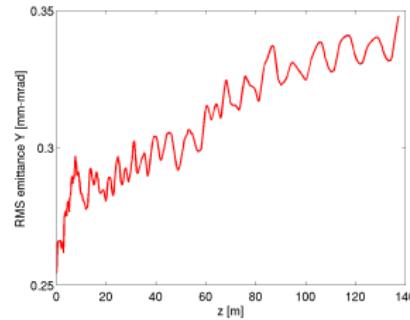


Figure: RMS Emittance X / CW

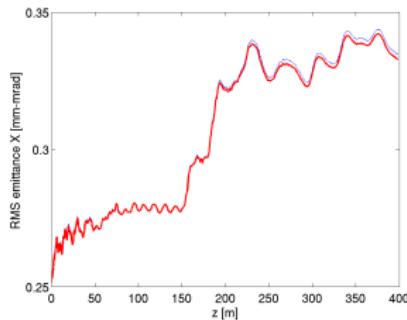
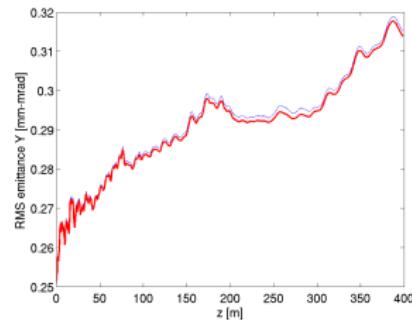


Figure: RMS Emittance Y / CW



(58) Cavities $\phi_z = 5$ mrad

Figure: RMS Emittance X / Pulsed

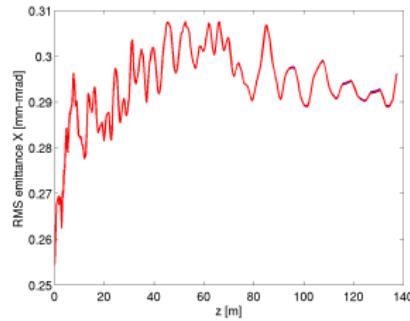


Figure: RMS Emittance Y / Pulsed

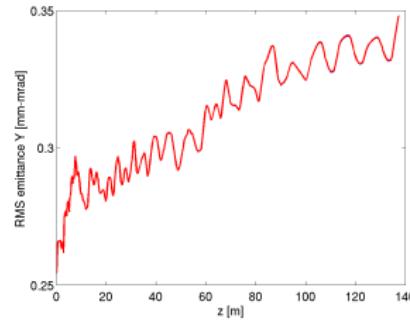


Figure: RMS Emittance X / CW

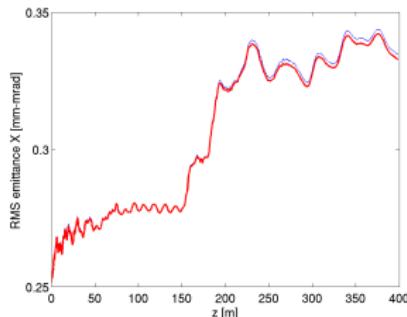
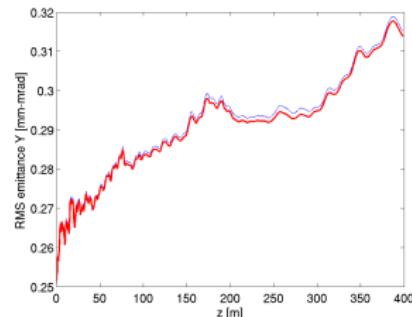


Figure: RMS Emittance Y / CW



(59) Cavities $\phi_z = 7$ mrad

Figure: RMS Emittance X / Pulsed

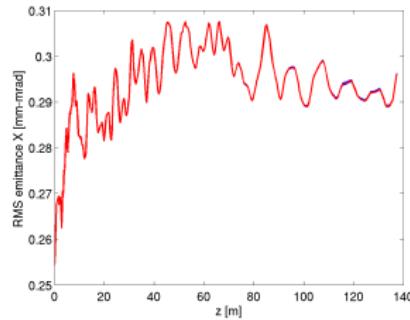


Figure: RMS Emittance Y / Pulsed

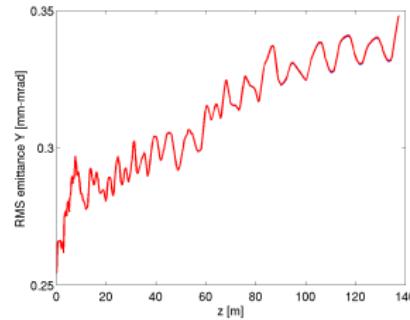


Figure: RMS Emittance X / CW

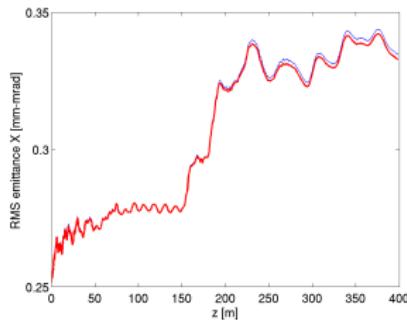
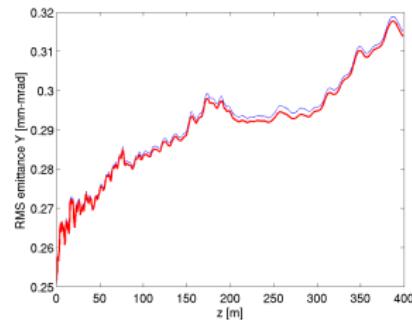


Figure: RMS Emittance Y / CW



(60) Cavities $\phi_z = 10$ mrad

Figure: RMS Emittance X / Pulsed

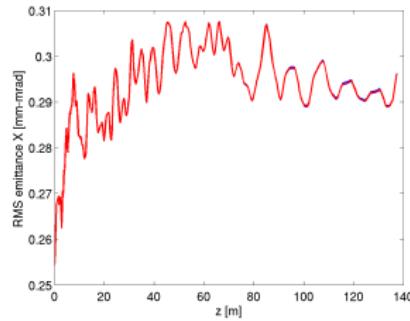


Figure: RMS Emittance Y / Pulsed

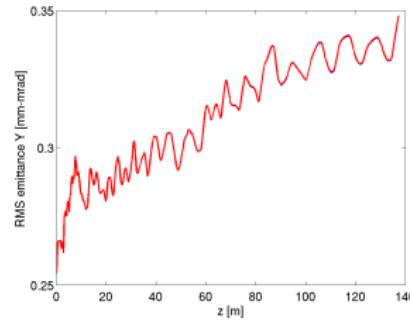


Figure: RMS Emittance X / CW

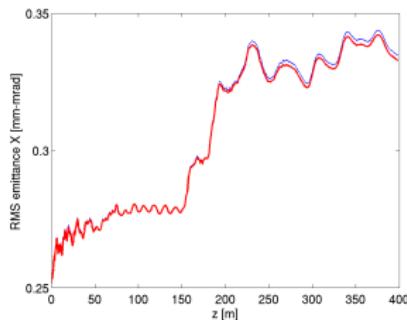
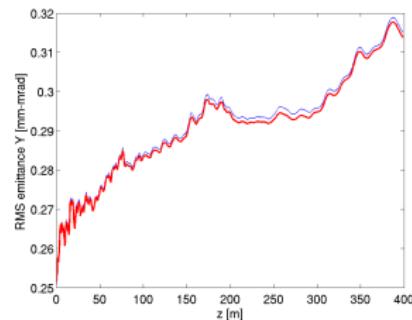


Figure: RMS Emittance Y / CW



(61) Cav. Phase $\delta\phi_{dynamic} = 0.5^\circ$

Figure: RMS Emittance X / Pulsed

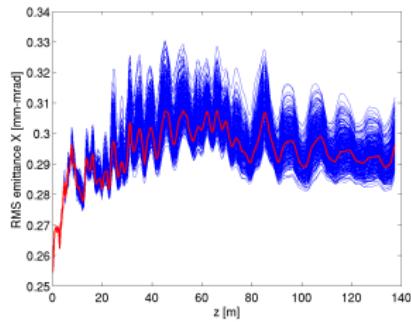


Figure: RMS Emittance Y / Pulsed

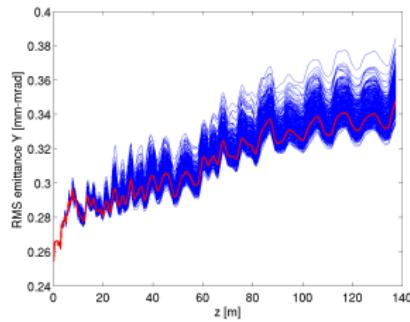


Figure: RMS Emittance X / CW

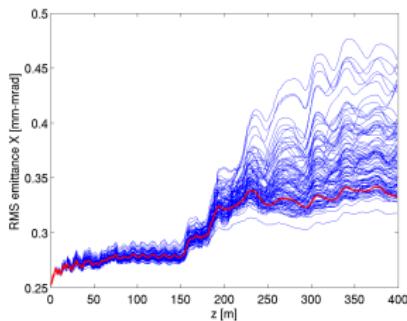
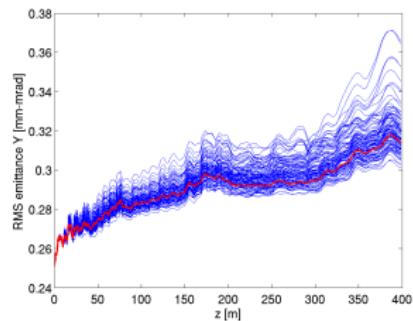


Figure: RMS Emittance Y / CW



(62) Cav. Phase $\delta\phi_{dynamic} = 1.0^\circ$

Figure: RMS Emittance X / Pulsed

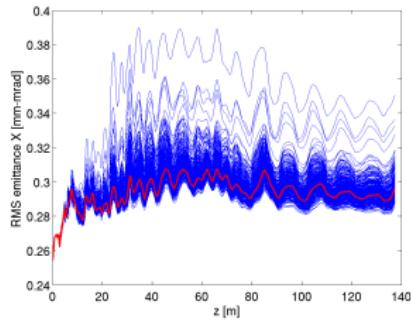


Figure: RMS Emittance Y / Pulsed

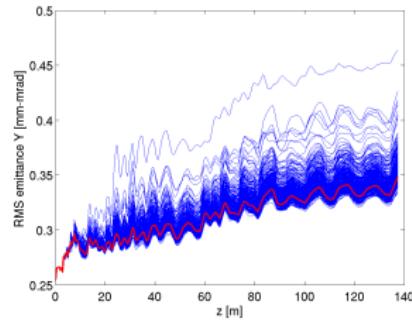


Figure: RMS Emittance X / CW

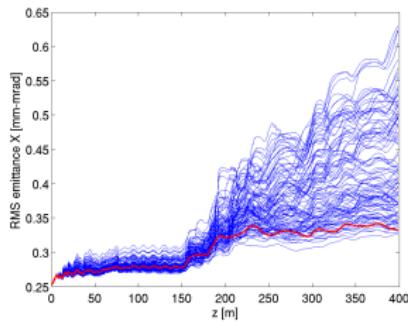
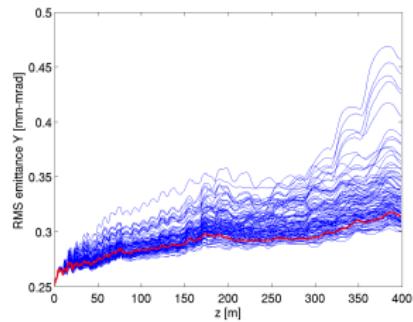


Figure: RMS Emittance Y / CW



(63) Cav. Phase $\delta\phi_{dynamic} = 1.5^\circ$

Figure: RMS Emittance X / Pulsed

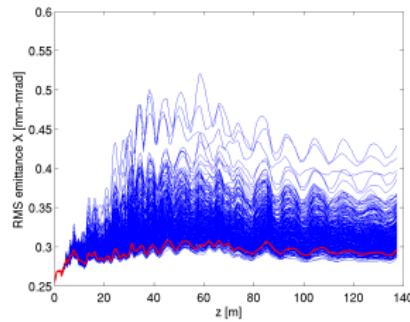


Figure: RMS Emittance Y / Pulsed

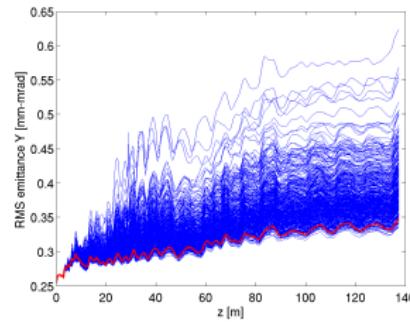


Figure: RMS Emittance X / CW

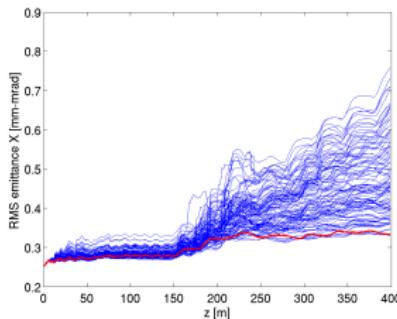
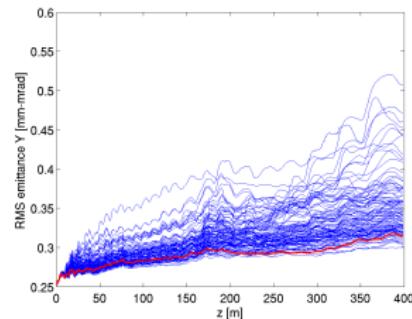


Figure: RMS Emittance Y / CW



(64) Cav. Phase $\delta\phi_{dynamic} = 2.0^\circ$

Figure: RMS Emittance X / Pulsed

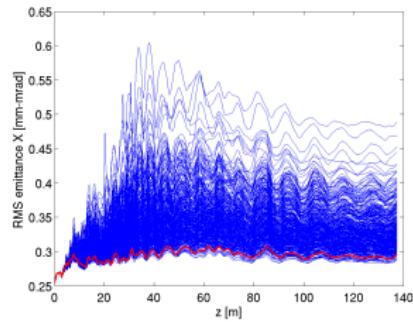


Figure: RMS Emittance Y / Pulsed

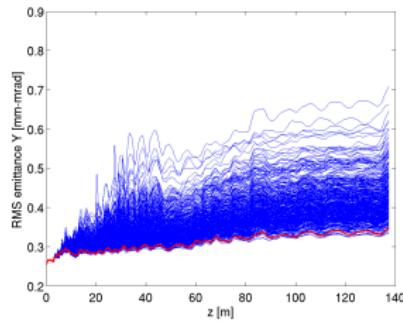


Figure: RMS Emittance X / CW

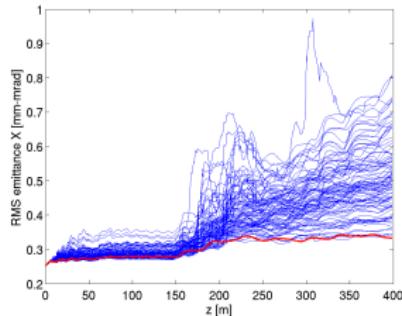
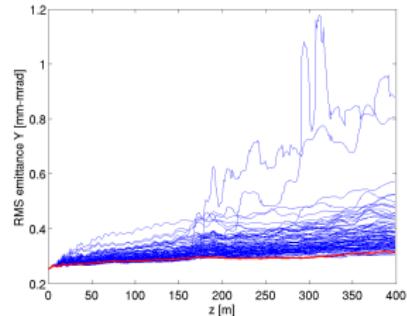


Figure: RMS Emittance Y / CW



(65) Cav. Phase $\delta\phi_{dynamic} = 2.5^\circ$

Figure: RMS Emittance X / Pulsed

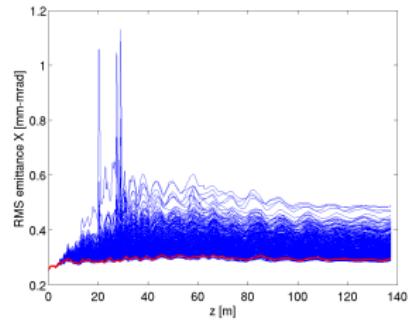


Figure: RMS Emittance Y / Pulsed

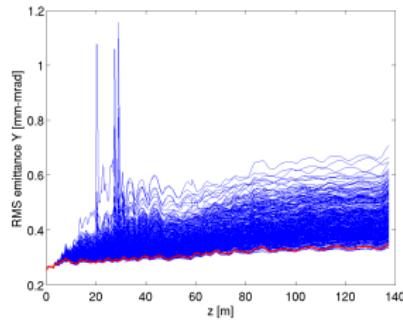


Figure: RMS Emittance X / CW

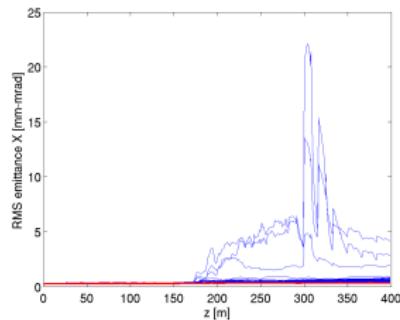
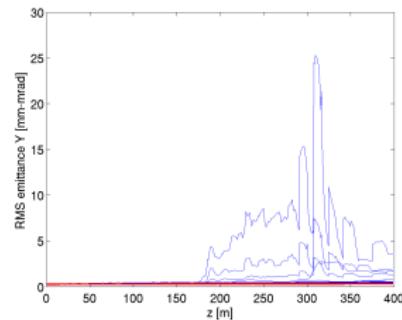


Figure: RMS Emittance Y / CW



(66) Cav. Field $\delta F_{dynamic} = 0.5 \%$

Figure: RMS Emittance X / Pulsed

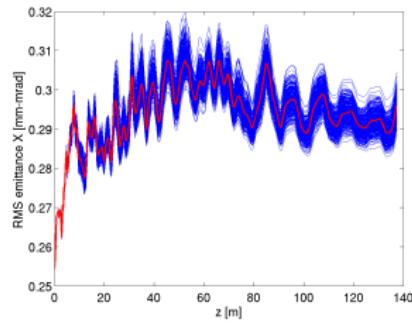


Figure: RMS Emittance Y / Pulsed

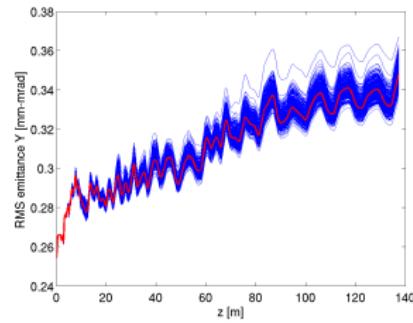


Figure: RMS Emittance X / CW

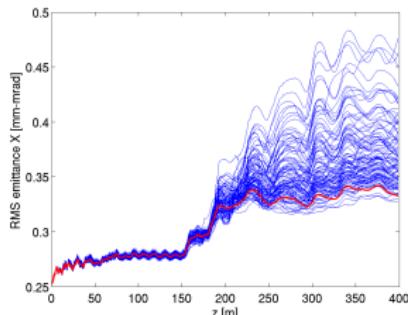
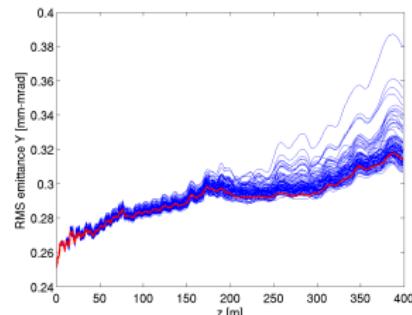


Figure: RMS Emittance Y / CW



(67) Cav. Field $\delta F_{dynamic} = 1.0 \%$

Figure: RMS Emittance X / Pulsed

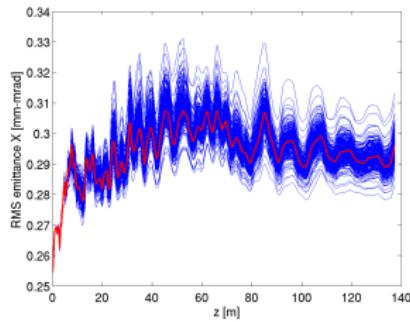


Figure: RMS Emittance Y / Pulsed

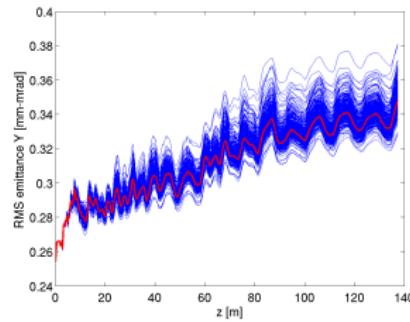


Figure: RMS Emittance X / CW

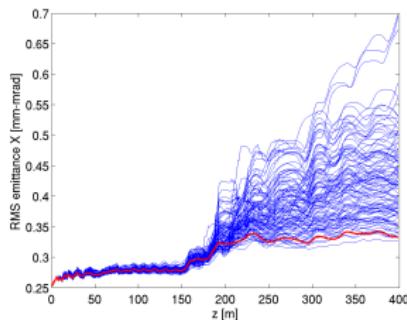
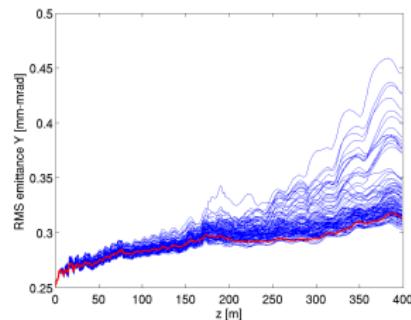


Figure: RMS Emittance Y / CW



(68) Cav. Field $\delta F_{dynamic} = 1.5 \%$

Figure: RMS Emittance X / Pulsed

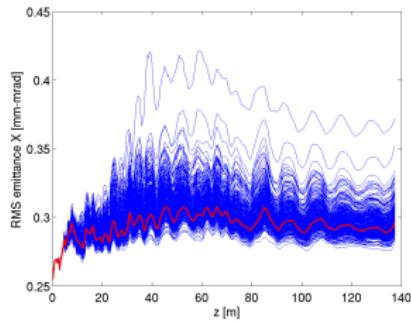


Figure: RMS Emittance Y / Pulsed

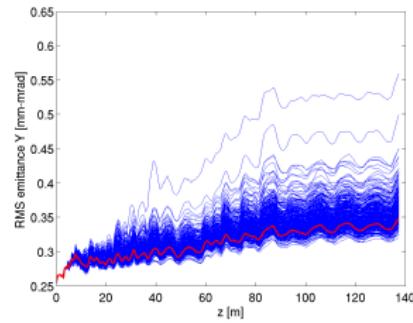


Figure: RMS Emittance X / CW

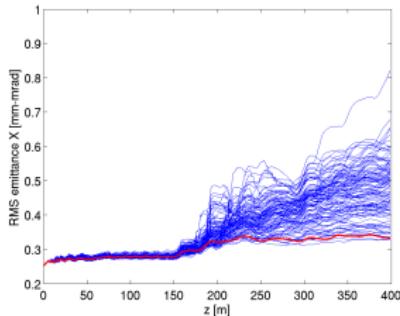
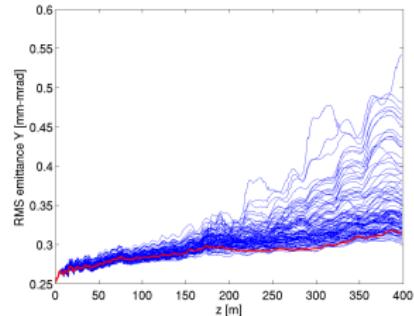


Figure: RMS Emittance Y / CW



(69) Cav. Field $\delta F_{dynamic} = 2.0 \%$

Figure: RMS Emittance X / Pulsed

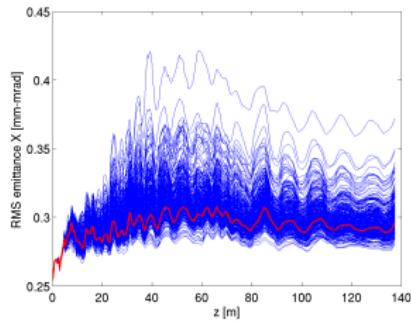


Figure: RMS Emittance Y / Pulsed

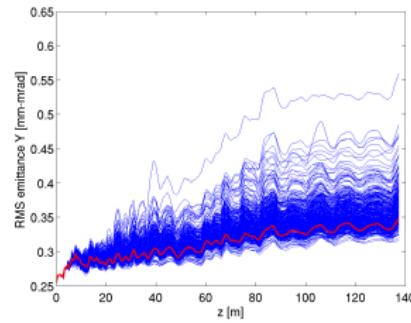


Figure: RMS Emittance X / CW

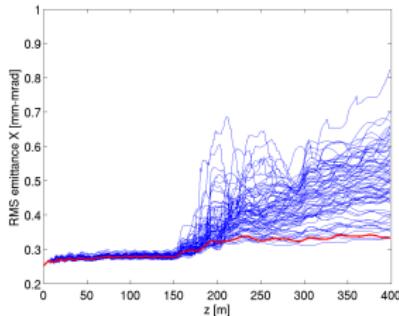
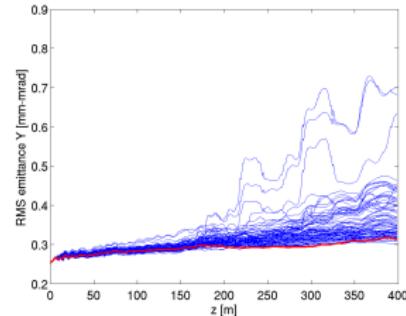


Figure: RMS Emittance Y / CW



(70) Cav. Field $\delta F_{dynamic} = 2.5 \%$

Figure: RMS Emittance X / Pulsed

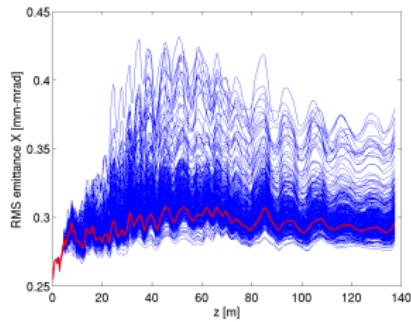


Figure: RMS Emittance Y / Pulsed

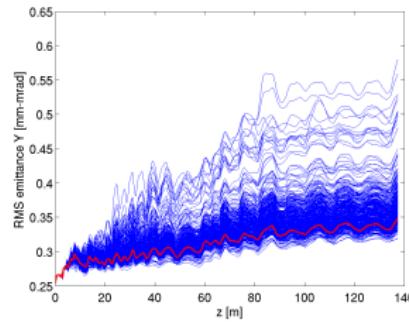


Figure: RMS Emittance X / CW

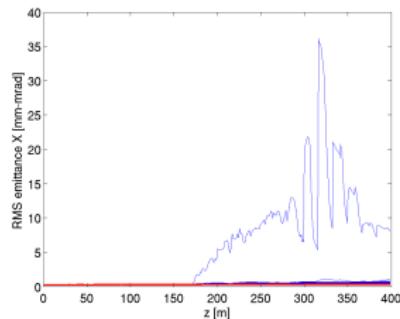
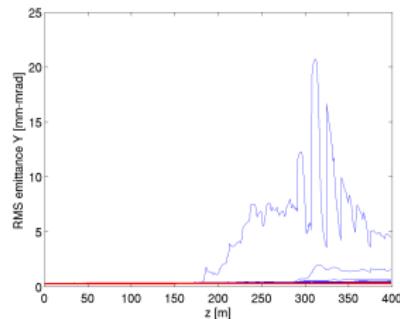


Figure: RMS Emittance Y / CW



(71) Cav. Phase $\delta\phi_{static} = 0.5^\circ$

Figure: RMS Emittance X / Pulsed

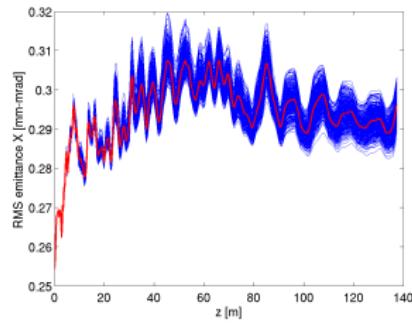


Figure: RMS Emittance Y / Pulsed

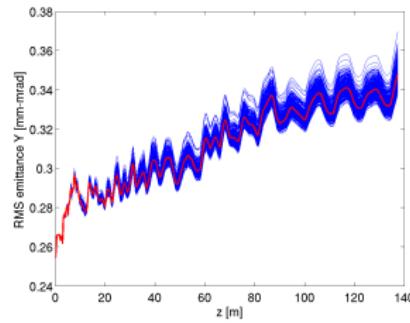


Figure: RMS Emittance X / CW

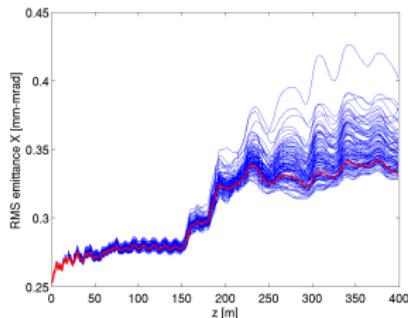
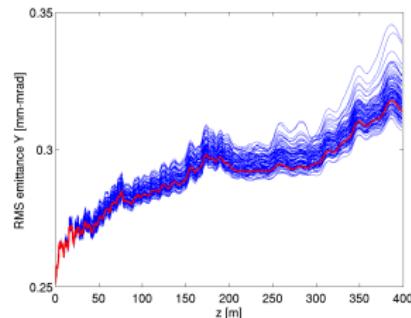


Figure: RMS Emittance Y / CW



(72) Cav. Phase $\delta\phi_{static} = 1.0^\circ$

Figure: RMS Emittance X / Pulsed

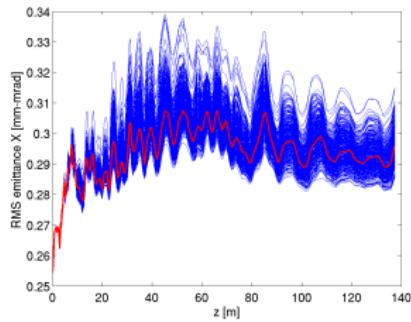


Figure: RMS Emittance Y / Pulsed

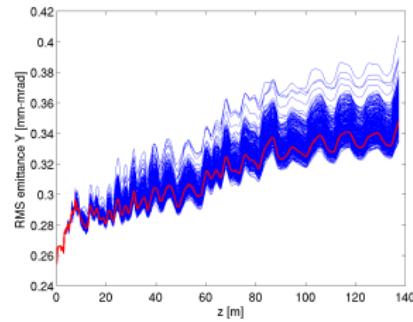


Figure: RMS Emittance X / CW

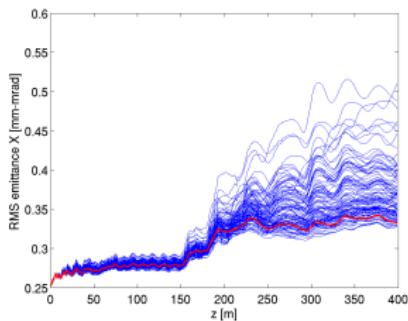
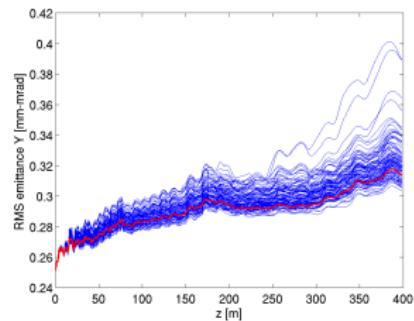


Figure: RMS Emittance Y / CW



(73) Cav. Phase $\delta\phi_{static} = 1.5^\circ$

Figure: RMS Emittance X / Pulsed

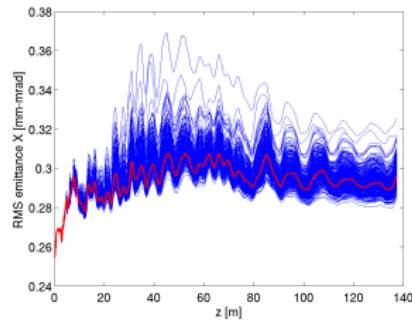


Figure: RMS Emittance Y / Pulsed

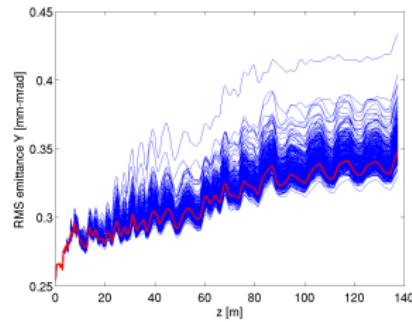


Figure: RMS Emittance X / CW

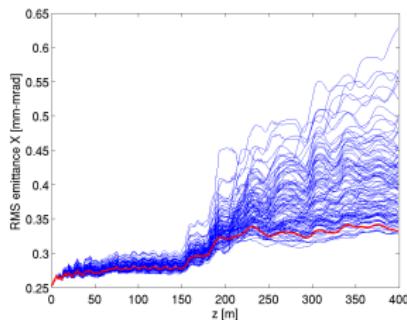
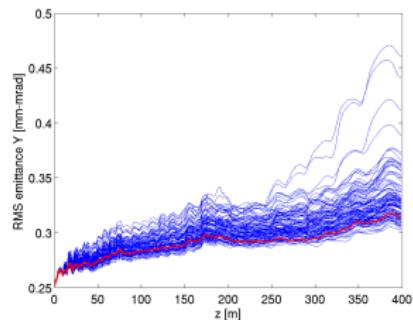


Figure: RMS Emittance Y / CW



(74) Cav. Phase $\delta\phi_{static} = 2.0^\circ$

Figure: RMS Emittance X / Pulsed

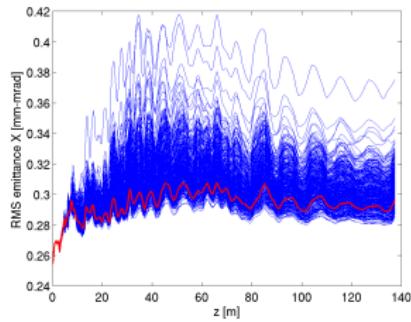


Figure: RMS Emittance Y / Pulsed

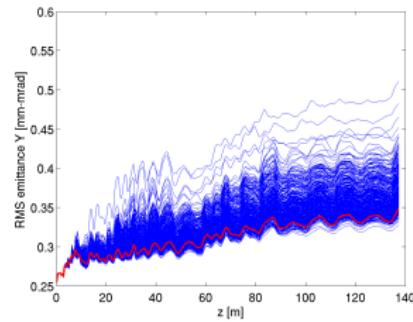


Figure: RMS Emittance X / CW

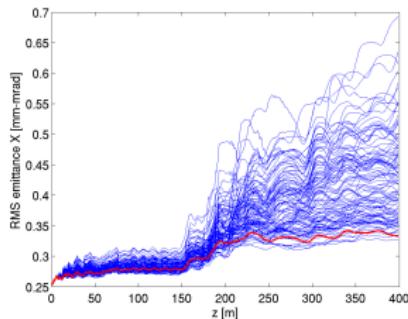
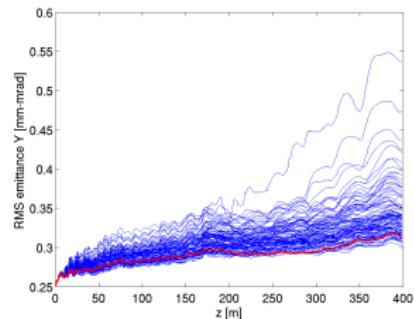


Figure: RMS Emittance Y / CW



(75) Cav. Phase $\delta\phi_{static} = 2.5^\circ$

Figure: RMS Emittance X / Pulsed

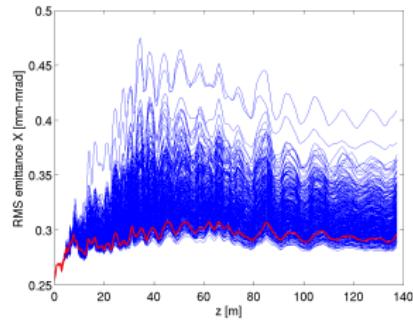


Figure: RMS Emittance Y / Pulsed

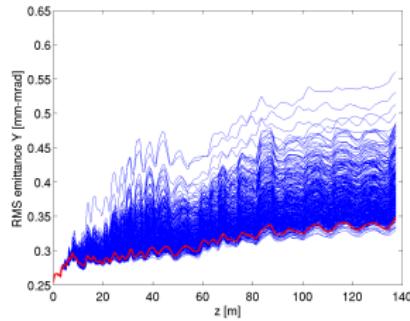


Figure: RMS Emittance X / CW

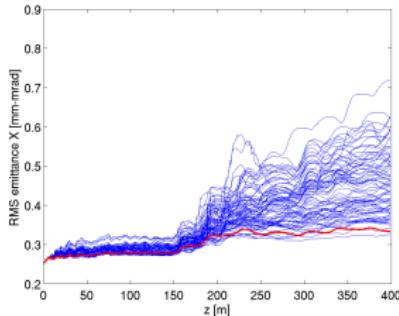
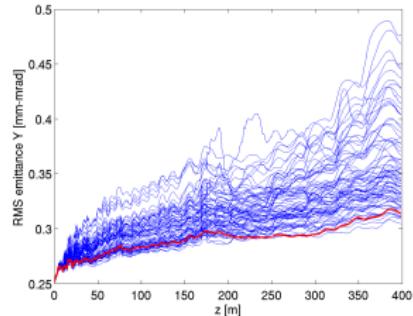


Figure: RMS Emittance Y / CW



(76) Cav. Field $\delta F_{static} = 0.5 \%$

Figure: RMS Emittance X / Pulsed

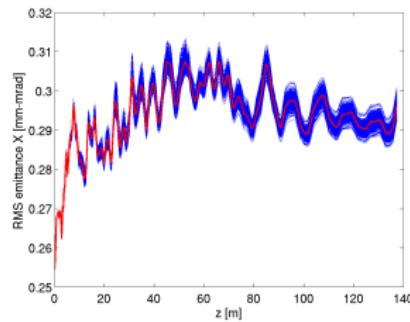


Figure: RMS Emittance Y / Pulsed

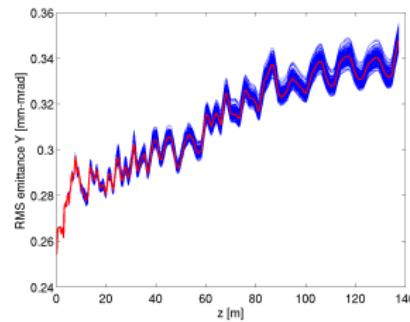


Figure: RMS Emittance X / CW

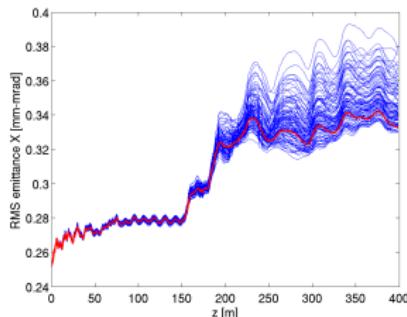
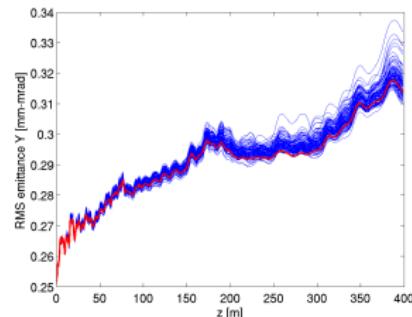


Figure: RMS Emittance Y / CW



(77) Cav. Field $\delta F_{static} = 1.0 \%$

Figure: RMS Emittance X / Pulsed

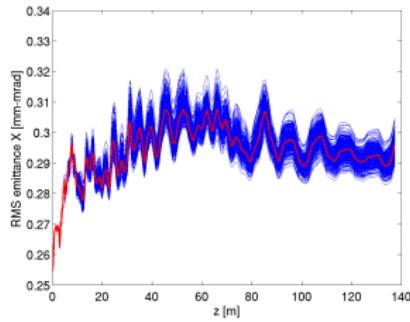


Figure: RMS Emittance Y / Pulsed

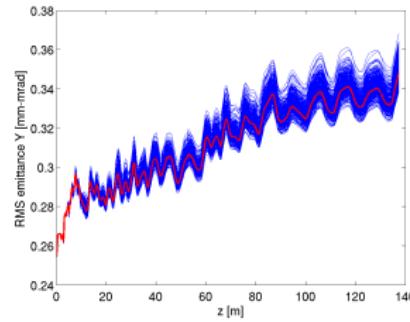


Figure: RMS Emittance X / CW

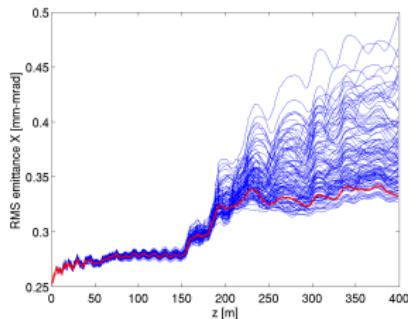
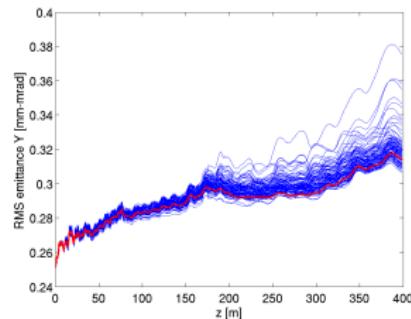


Figure: RMS Emittance Y / CW



(78) Cav. Field $\delta F_{static} = 1.5 \%$

Figure: RMS Emittance X / Pulsed

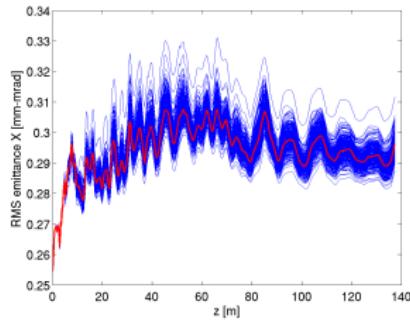


Figure: RMS Emittance Y / Pulsed

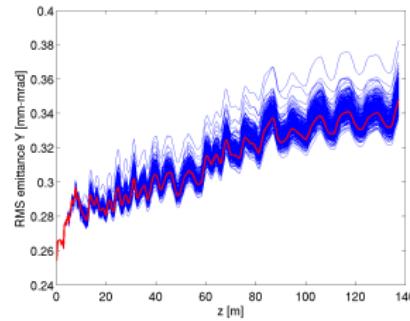


Figure: RMS Emittance X / CW

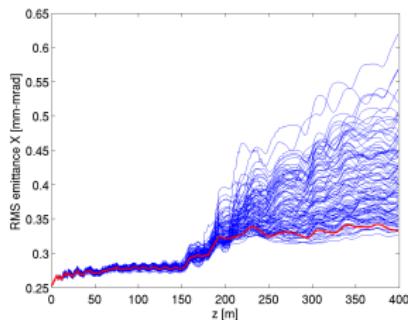
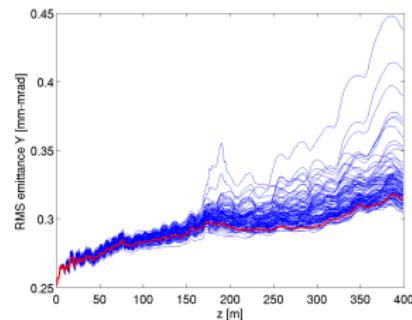


Figure: RMS Emittance Y / CW



(79) Cav. Field $\delta F_{static} = 2.0 \%$

Figure: RMS Emittance X / Pulsed

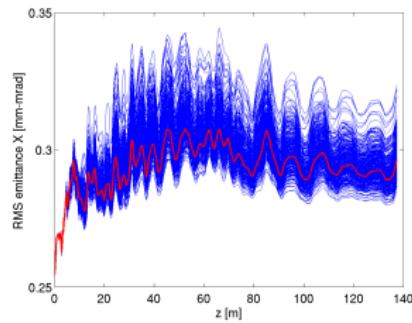


Figure: RMS Emittance Y / Pulsed

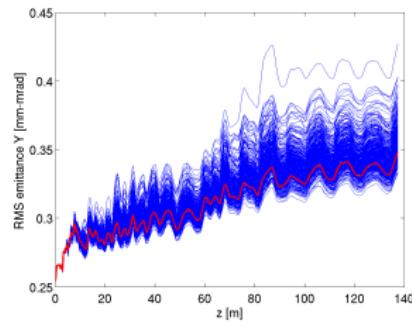


Figure: RMS Emittance X / CW

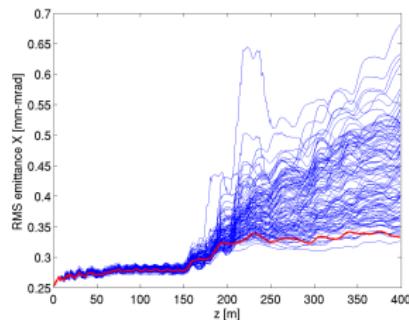
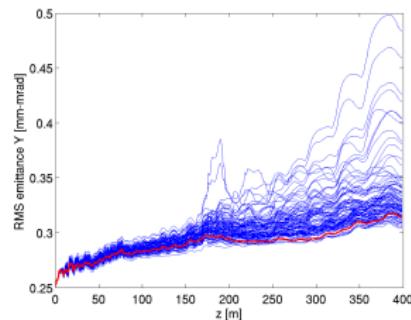


Figure: RMS Emittance Y / CW



(80) Cav. Field $\delta F_{static} = 2.5 \%$

Figure: RMS Emittance X / Pulsed

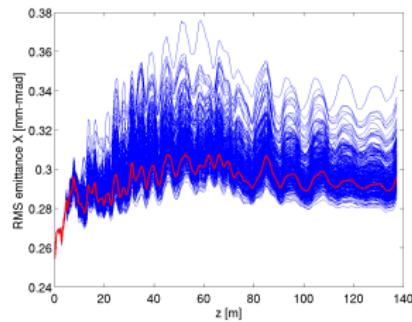


Figure: RMS Emittance Y / Pulsed

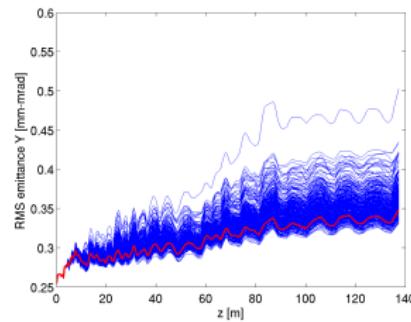


Figure: RMS Emittance X / CW

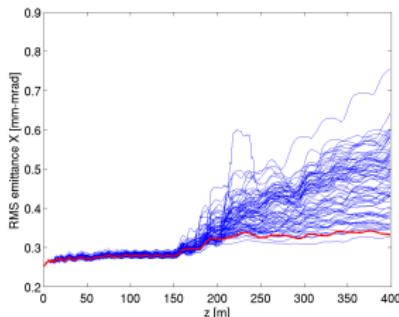
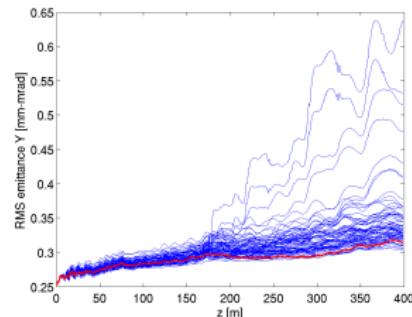


Figure: RMS Emittance Y / CW



(81) Cav. Phase + Cav. Field $\delta\phi_{dyn.} = 1^\circ$ $\delta F_{dyn.} = 1\%$

Figure: RMS Emittance X / Pulsed

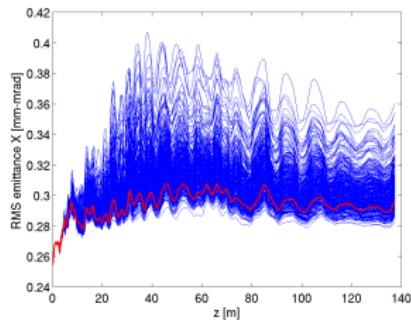


Figure: RMS Emittance Y / Pulsed

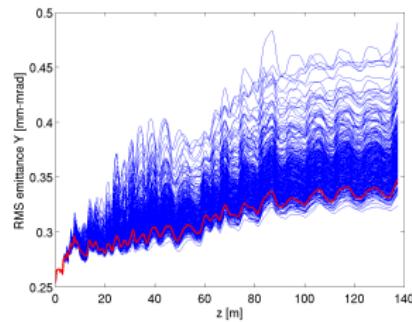


Figure: RMS Emittance X / CW

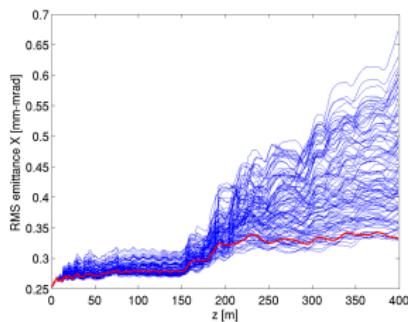
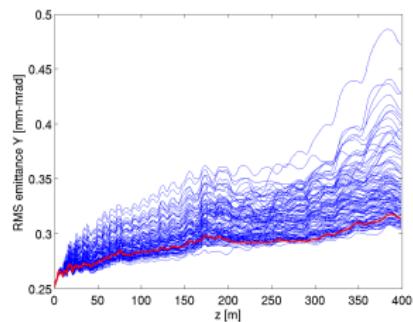


Figure: RMS Emittance Y / CW



$$(82) \text{ 81+ Sol. Field } \delta F_{dyn.} = 0.5 \% \quad \delta F_{static} = 0.05 \%$$

Figure: RMS Emittance X / Pulsed

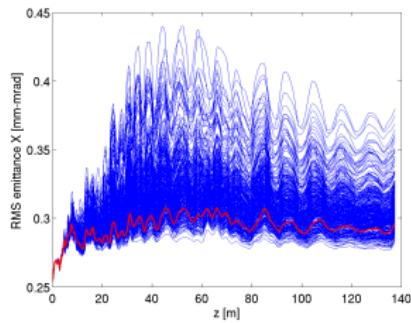


Figure: RMS Emittance Y / Pulsed

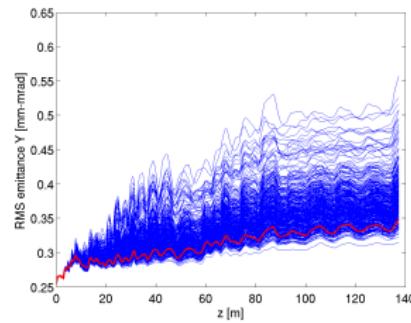


Figure: RMS Emittance X / CW

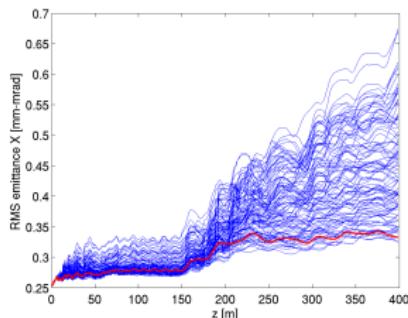
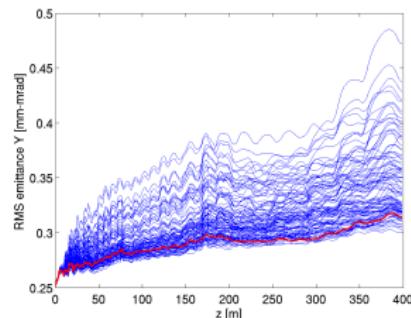


Figure: RMS Emittance Y / CW



$$(83) 82 + \text{Quads Fields } \delta F_{dyn.} = 0.5 \% \quad \delta F_{static} = 0.05 \%$$

Figure: RMS Emittance X / Pulsed

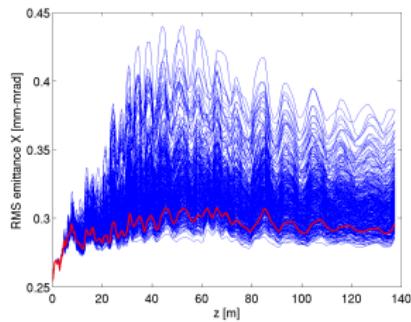


Figure: RMS Emittance Y / Pulsed

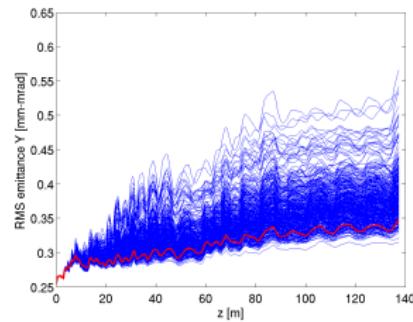


Figure: RMS Emittance X / CW

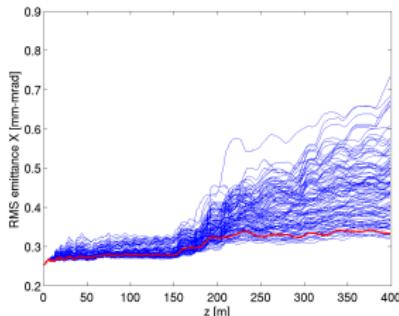
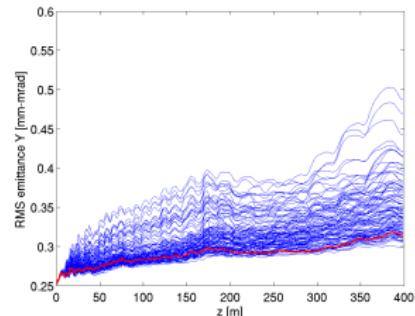


Figure: RMS Emittance Y / CW



$$(84) 83 + \text{Cav. } \delta_{xy} = 500 \mu\text{m}$$

Figure: RMS Emittance X / Pulsed

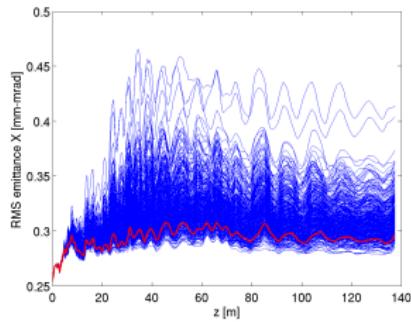


Figure: RMS Emittance Y / Pulsed

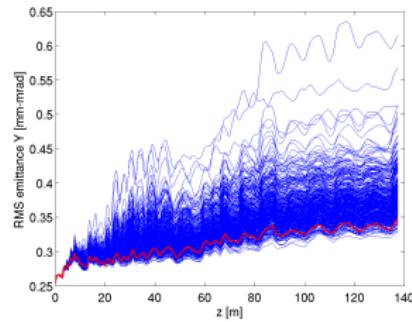


Figure: RMS Emittance X / CW

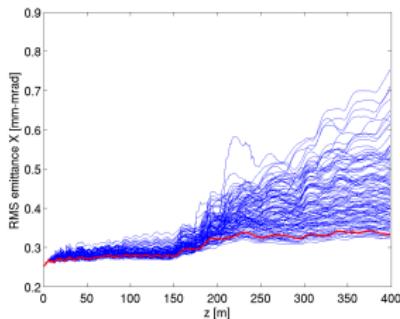
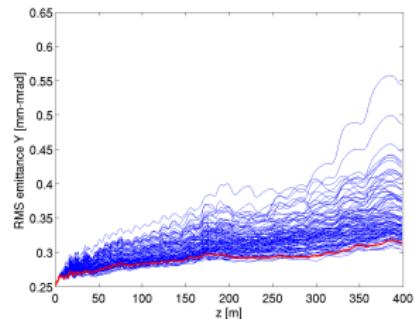


Figure: RMS Emittance Y / CW



$$(85) 84 + \text{Cav. } \phi_z = 2 \text{ mrad}$$

Figure: RMS Emittance X / Pulsed

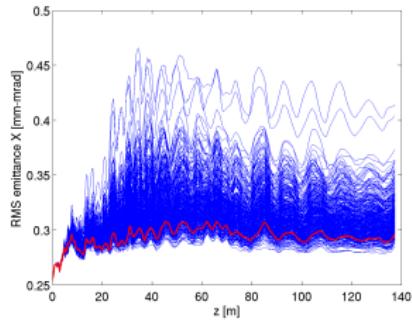


Figure: RMS Emittance Y / Pulsed

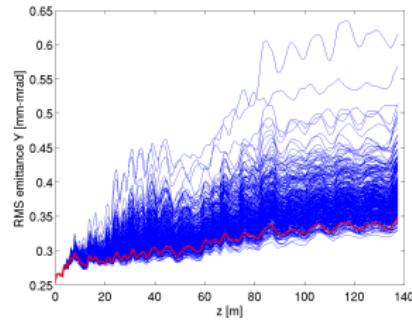


Figure: RMS Emittance X / CW

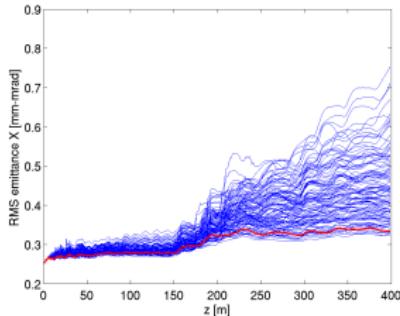
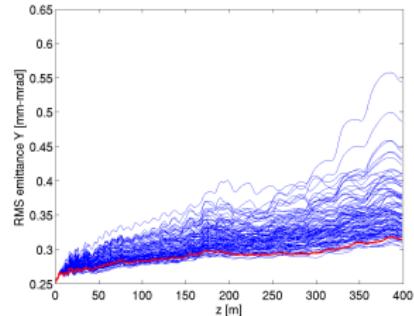


Figure: RMS Emittance Y / CW



$$(86) 85 + \text{Sol. } \delta_{xy} = 150 \mu\text{m}$$

Figure: RMS Emittance X / Pulsed

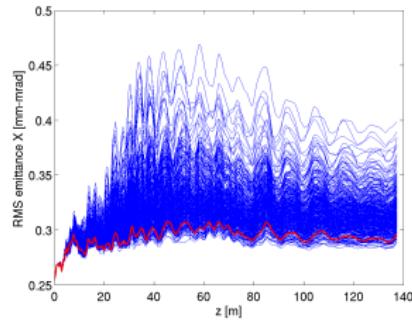


Figure: RMS Emittance Y / Pulsed

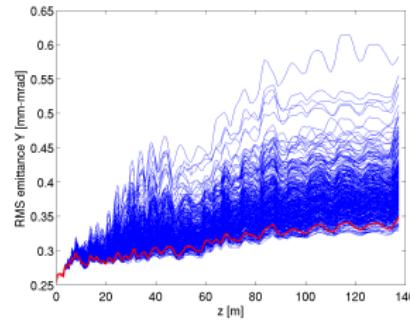


Figure: RMS Emittance X / CW

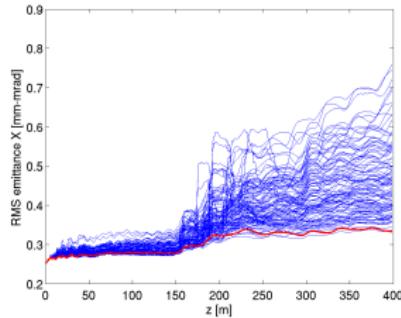
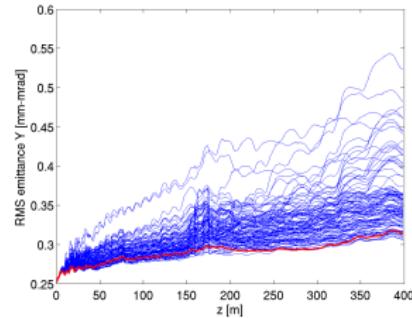


Figure: RMS Emittance Y / CW



$$(87) 86 + \text{Sol. } \delta_{xy} = 300 \mu\text{m}$$

Figure: RMS Emittance X / Pulsed

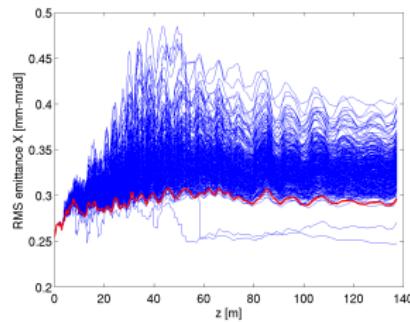


Figure: RMS Emittance Y / Pulsed

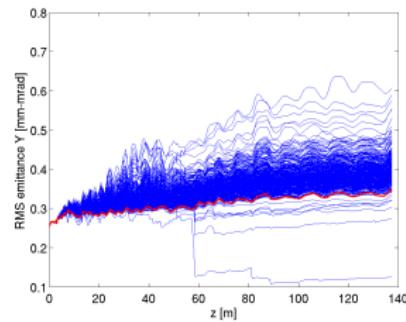


Figure: RMS Emittance X / CW

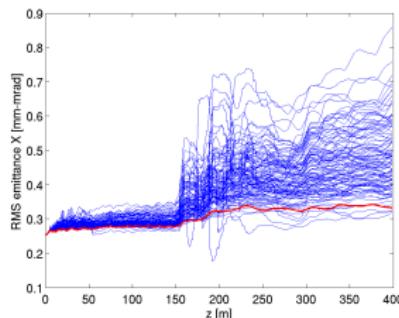
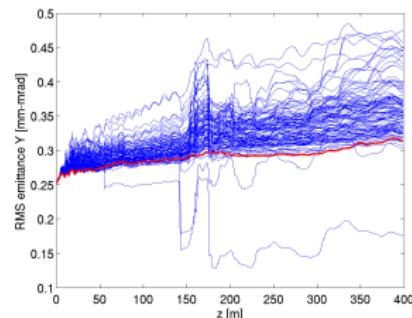


Figure: RMS Emittance Y / CW



$$(88) \ 87 + \text{Sol. } \delta_{xy} = 500 \ \mu\text{m}$$

Figure: RMS Emittance X / Pulsed

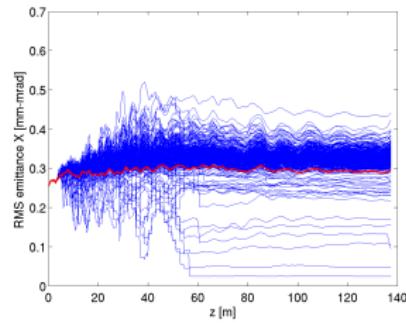


Figure: RMS Emittance Y / Pulsed

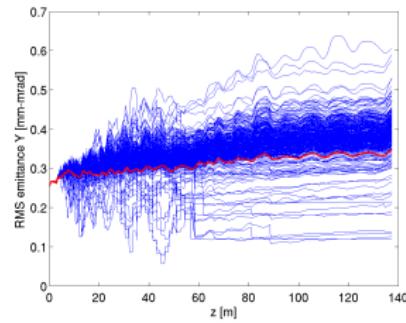


Figure: RMS Emittance X / CW

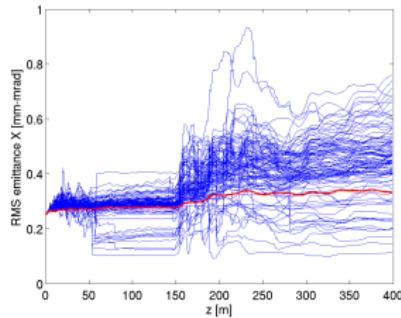
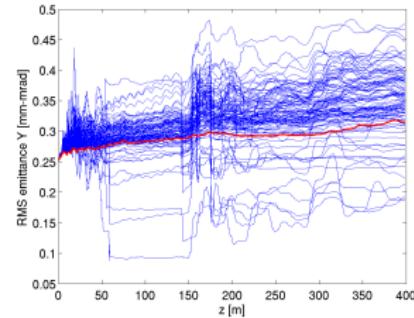


Figure: RMS Emittance Y / CW



$$(89) 88 + \text{Sol. } \delta_{xy} = 750 \mu\text{m}$$

Figure: RMS Emittance X / Pulsed

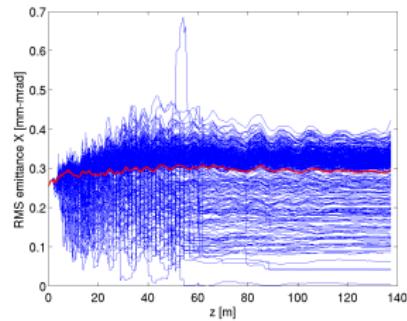


Figure: RMS Emittance Y / Pulsed

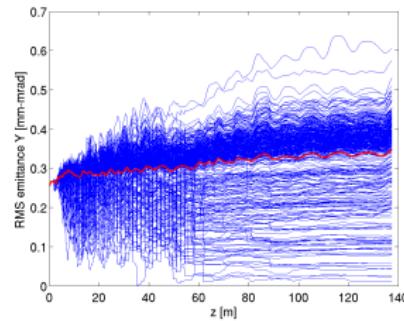


Figure: RMS Emittance X / CW

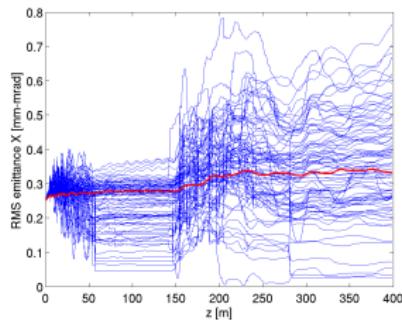
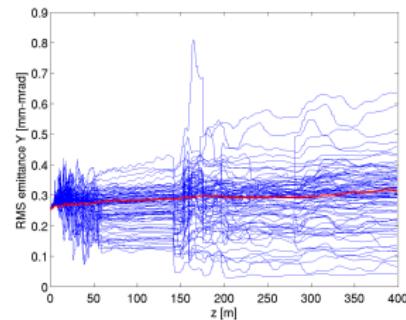


Figure: RMS Emittance Y / CW



$$(90) \ 89 + \text{Sol. } \delta_{xy} = 1000 \ \mu\text{m}$$

Figure: RMS Emittance X / Pulsed

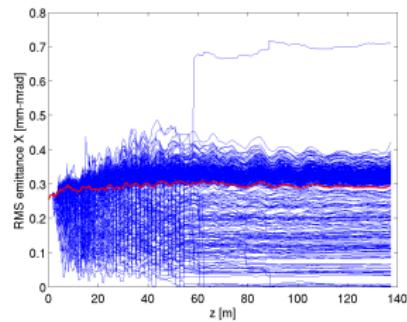


Figure: RMS Emittance Y / Pulsed

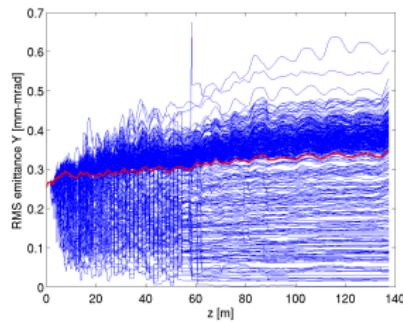


Figure: RMS Emittance X / CW

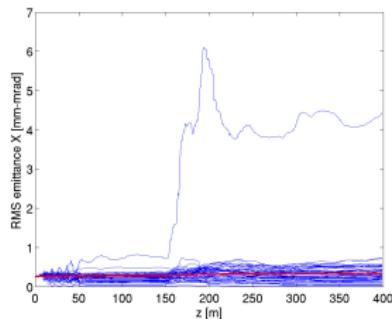


Figure: RMS Emittance Y / CW

